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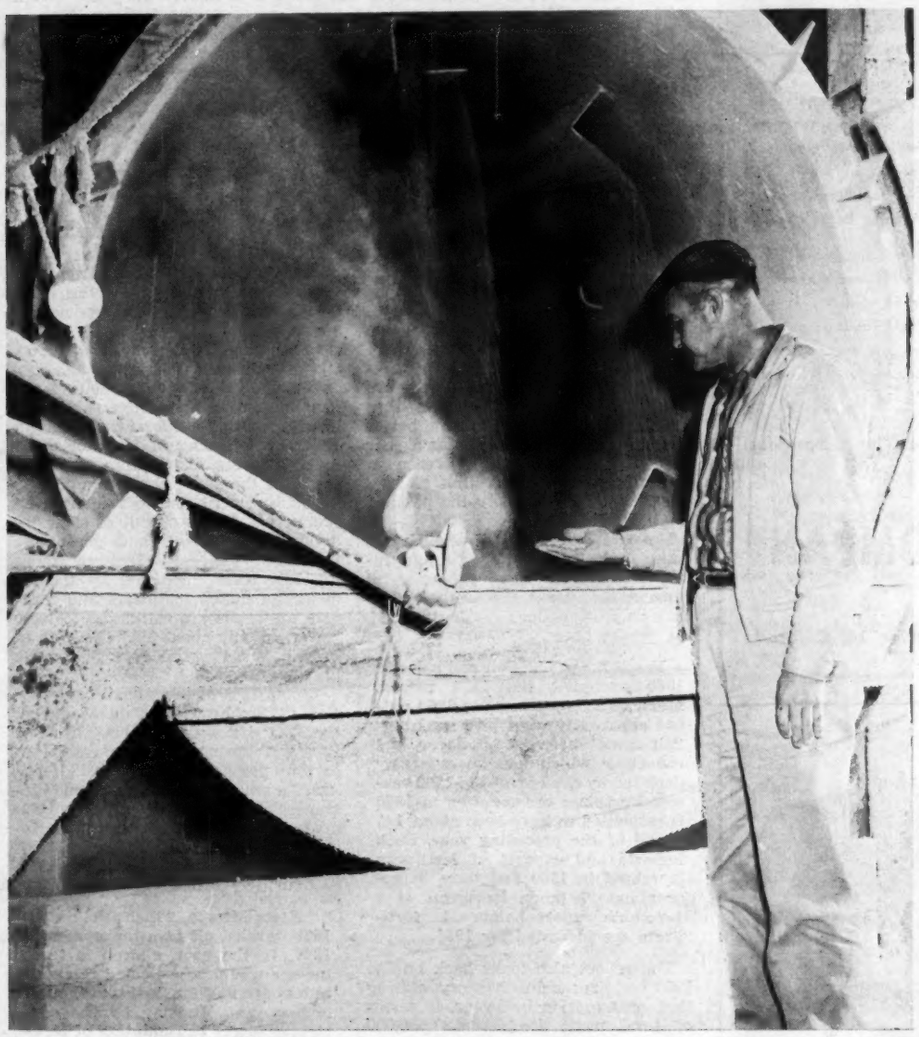

PELLETS UNIFORM? Typical of many superintendents who keep watchful eyes and sensitive hands on the plant's product, is John Souter, of Red Star fertilizer plant, Sulphur Springs, Texas. Here he inspects pellets at discharge end of cooler. (Plant story page 38.)

News Briefs . . .

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Fertilizer Industry's Joint Meeting With College Agronomists Draws Trade Interest

CHICAGO—The fertilizer industry's 13th annual joint meeting with midwest college agronomists is scheduled for Feb. 16-17 at the Edgewater Beach Hotel, Chicago. The meeting attracts management, sales, and technical personnel from the plant food industry over a wide area of the nation. The midwest regional office of the National Plant Food Institute is sponsor of the event.

Allen J. Kindle, coal chemicals division, U.S. Steel Corp., Pittsburgh, Pa., member of the NPFI merchandising committee, is to speak on "Opportunities for Profit" on Thursday morning, Feb. 16, and Douglas R. Graves, assistant vice president, Harris Trust & Savings Bank, Chicago, discusses credit needs of the industry.

Other speakers include Zenas H. Beers, Midwest regional director, National Plant Food Institute, Chicago, who is scheduled to welcome the group to the conference; Dr. M. B. Russell, head of the department of agronomy, University of Illinois, Urbana; Herbert R. Albrecht, associate dean and director of extension, Pennsylvania State University, University Park, Pa.; John T. Pesek, professor of soils, Iowa State University, Ames, Iowa; L. E. Engelbert, professor and chairman, department of soils, University of Wisconsin, Madison; Everett M. Rogers, assistant professor, department of agricultural economics and rural sociology, Ohio State University, Columbus, Ohio; Marvin Beatty, assistant professor of soils, University of Wisconsin, Madison; and Gordon J. Ryder, associate professor, department of agronomy, Ohio State University, Columbus.

R. L. Cook, professor and head of the department of soil science, Michigan State University, East Lansing, Mich., is scheduled to preside at the session of Friday, Feb. 17.

Appearing on that portion of the program is Dr. M. B. Russell; Douglas R. Graves; Floyd W. Smith, professor of agronomy and soil fertility, Kansas State University, Manhattan, Kansas, and H. J. Mederski, professor of agronomy, Ohio State Agricultural Experiment Station, Wooster, Ohio.

Features Inside →

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Floyd W. Smith Dr. M. B. Russell R. L. Cook

CONVENTION SPEAKERS—The fertilizer industry's 13th annual joint meeting with midwest college agronomists features speakers from the industry and from colleges and universities in the area. Among those scheduled to appear on the program are the three men above. They are (from left): Floyd W. Smith, professor of agronomy and soil fertility, Kansas State University; Dr. M. B. Russell, head of the department of agronomy, University of Illinois, and R. L. Cook, professor and head of the department of soil science, Michigan State University. The meeting is scheduled for Feb. 16-17 at the Edgewater Beach Hotel, Chicago.

Production and Demand for Fertilizer In 1961 May Exceed Last Year's Tally

WASHINGTON—The demand for fertilizers in 1961 is expected to be slightly above the 1960 level, according to a report issued Jan. 12 by the Chemical and Rubber division of Business and Defense Services Administration, U.S. Department of Commerce. The report states that the fertilizer industry is in a better inventory position than it was a year ago, and little if any increase in rate of production over that of 1960 will be needed to satisfy the possible small increase in demand.

However, the fertilizer industry is optimistic about the long-range future because extensive expansion in capacity of various basic fertilizer materials is underway or planned, the report notes.

Fertilizer production and sales in 1960 exceeded the 1959 record. Much of the increment in 1960 output apparently went into inventory "pipelines" between producer and consumer which had been largely depleted by the end of the 1959 season. Fertilizer consumption in 1960 is estimated to have been about 1% ahead of the preceding year. Both imports and exports of fertilizers increased in 1960 and were in approximate balance. Prospects of a favorable export balance in fertilizers are indicated for 1961.

The report also looks back on the 1960 fertilizer industry story, stating that consumption last year, in terms of total plant food, was 7,500,000 tons, or about 1% higher than the record use of 1959. When all reports are in, it says, the gross tonnage of fertilizers consumed last year "apparently will be changed little if any from the 25,313,000 tons used in 1959 because of the continuing trend toward higher analysis materials," the Commerce Department report observed.

Continuing on the review of 1960, the report says:

"Production of the various fertilizer materials increased considerably more than apparent consumption in 1960. Replenishing of inventories by manufacturers, distributors, and dealers after the heavy shipments of 1959 probably contributed to the improved production. While output of some individual nitrogenous and phosphatic fertilizers increased 10% or more in 1960, total shipments by the industry of mixed fertilizers and separate materials are estimated to have increased only about 3%. This rate of growth is below the average for the previous 9 years.

"Some 70% of the annual consumption of fertilizer takes place during the first 6 months of the year. The late wet spring which prevailed in certain areas in 1960 delayed fertilizer application and in some instances the delays may not have been made up later. Thus, under more favorable weather conditions, sales of fertilizers might well have been higher than they actually were in 1960.

"Farm income, which declined in 1959, leveled off at a lower rate in 1960. In the past, a drop in farm income would be expected to result in less demand for fertilizer the following year. Judging by the continuing heavy consumption of fertilizer in 1960, the possible relationship of fertilizer demand and farm income appears to be lessening.

"Exports of fertilizers, which account for approximately 10% of to-

TABLE 1. Manufacturers' Shipments and Index of Production of Chemical Fertilizers (Millions of Dollars)

Year	A Mixed fertilizers	B Superphosphates	C Total superphosphates & mixed fertilizers[1]	D Nitrogenous and potash materials	E Total of all shipments	F.R.B. index of fertilizer production ('57=100)
1950	546	104	659	70	729	75
1951	648	109	765	78	843	82
1952	734	111	852	98	950	90
1953	793	118	919	111	1,020	93
1954	707	131	855	137	992	98
1955	707	138	860	158	1,018	99
1956	693	142	851	156	1,007	99
1957	718	149	880	168	1,048	100
1958	716	155	886	177	1,063	100
1959	[2]783	[2]180	[2]980	200	1,180	112
1960	[2]793	[2]190	[2]1,000	220	1,220	[2]114

[1]Includes in addition to mixed fertilizers and superphosphates also fertilizer materials of organic origin, and fertilizers not specified by kind.
[2]Estimated by Chemical and Rubber Division.
Source: Columns A, B and C represent values of shipments of fertilizers from plants classified by the Bureau of Census as within the fertilizer industry. Column D represents estimates of the values of nitrogenous and potassic chemicals shipped by the chemical industry directly to fertilizer users.

tal fertilizer shipments, were lagging in the early part of 1960 but picked up in the second half of the year. The 1960 total apparently will be at least 5% ahead of 1959 exports. Also, 1960 fertilizer imports have increased by about 5%. Total value of the imports was slightly higher than that of the exports but the imbalance was narrowing after midyear. Phosphate rock and potash were the major items contributing to the improved export trade while various nitrogenous materials and potash were imported in larger volume.

"Fertilizer inventories in the 'pipelines' from manufacturer through distributor and retailer were in considerably higher volume at the end of 1960 than they were in 1959. The industry is in good position to meet anticipated demand."

A number of "ifs" accompany the prediction that 1961 will be a better year for production of fertilizer than was its immediate predecessor. The report says that a higher level of fertilizer consumption is expected to continue in 1961 and may possibly exceed the volume used in 1960.

However, it says, "if no marked upsurge in demand occurs, the fertilizer industry, starting the season with larger inventories than were on hand in 1960, may not quite attain the high level of production of the past year. New or expanded facilities for the production of phosphoric acid, ammonium phosphates, and other fertilizer materials are under construction or planned for completion in 1961 and 1962.

"The trends toward higher analysis products, greater use of the individual component materials, and expansion of bulk blending, granulation, and liquid fertilizers are expected to continue in 1961. The changes that are taking place in new technology, or demand for certain types of fertilizers may result in spot shortages of some materials in the peak spring season. However, overall supplies of fertilizers will be adequate for foreseeable demands in 1961.

"The improvement in export trade of fertilizers which took place in the last half of 1960 is expected to continue in 1961 and may possibly tip the balance in favor of exports. Imports of potash from Europe may decline in 1961 because of strikes or mechanical failures at potash mines in France and Spain. However, potash from Canada may come on the world market during the year."

Cotton Conference Talks Laud Use of Insecticides

GREENVILLE, S.C. — Attendants at the 1961 Beltwide Cotton Production-Mechanization Conference at Greenville, S.C. in January, heard talks lauding pesticides, defoliants, and plant disease chemicals in connection with the economical output of the crop.

Speakers discussing chemical control of pests included representatives of the U.S. Department of Agriculture, state experiment stations, and the National Cotton Council.

Dr. H. L. Haller, assistant to the administrator, Agricultural Research Service, USDA, said that chemicals probably have helped the nation's agriculture more than any other segment of our economy, and that farmers have "no present alternative to their use."

Dr. Walter J. Mistric, entomologist at the North Carolina experiment station, Raleigh, reiterated the points made by Dr. Haller, stating that cotton pests can be controlled by following a well-timed and well-executed program throughout the growing season.

The conference was sponsored by the National Cotton Council of America in cooperation with the Land Grant colleges, USDA, National Agricultural Chemicals Assn., Farm Equipment Institute, and farm organizations.

Armour Purchases Liquid Fertilizer Plant in Iowa

ATLANTA — Armour Agricultural Chemical Co., a division of Armour & Co. has announced its purchase of Ris-Van, Inc., Belmond, Iowa, wholly-owned subsidiary of Stepan Chemical Co., Chicago. The Iowa business will continue under the Ris-Van name as a division of Armour Agricultural Chemical Co. The present staff will be retained, according to the announcement.

Alfred C. Stepan, Jr., president of Stepan Chemical Co., stated that his firm plans to use the proceeds of the sale in a new venture in an unrelated field.

The Ris-Van firm was a pioneer in the field of supplying complete fertilizer in liquid form. Dr. John L. Strauss, former Purdue University agronomist and a vice president of Ris-Van, was one of the early developers of liquid fertilizers and has directed the scientific work of the company. He and other key management personnel will join Armour Agricultural Chemical Co.

Armour recently announced a $60,000,000 expansion program, which includes new facilities for production of high analysis fertilizer materials. Ris-Van will thus be provided with a more complete line of basic materials for its operations.

Continuing in the management of Ris-Van will be Kenneth Van Duzer, president; M. B. Hawke, sales manager and secretary, and Roy E. Carwell, treasurer.

Ris-Van plants are located at Belmond, West Union, Sanborn, Vinton and Jefferson, Iowa, and at Blue Earth and Willmar, Minn.

Headquarters of the Armour Agricultural Chemical Co. are in Atlanta, Ga. W. E. Shelburne is president.

MEETING DATES SET

YAKIMA, WASH. — Norkem Corporation of Yakima, Wash., has announced the dates for its third annual applicators and chemical conference as Oct. 9 and 10 at the Chinook Motel and Tower here.

CFA Announces Dates For Annual Convention

SACRAMENTO, CAL. — The thirty-eighth annual convention of the California Fertilizer Assn. will be held at the new Jack Tar Hotel in San Francisco, Nov. 12-14, 1961, according to James F. Sloan, association president.

Some 500 persons are expected to attend from all over the United States, and from Canada and Mexico.

The hotel is already accepting requests for room reservations, he pointed out.

NEW PILOT PLANT

MUSCLE SHOALS, ALA.—A new pilot plant designed to concentrate wet-process phosphoric acid has been placed in operation here by the Tennessee Valley Authority. Results of the pilot plant operations will be made known to the fertilizer industry, TVA engineers said.

18-46-0

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Safety Training Requires Strong Program in Plant

JUST AS IT takes "all kinds of people to make a world," it is equally true that a plant work force is composed of all kinds of men . . . fellows with good work habits and others with sloppy ones. Some with the ability to go about their jobs carefully and accident-free, while others seem to have an infinite capacity for getting into trouble of all kinds.

Knowing these differences and determining why any group of men may have such wide variations is a complex study for psychologists, but the plant foreman must figure out definite ways and means of meeting the challenges of day-by-day situations.

The National Safety Council has recently issued a series of booklets entitled "Men and Motives in Safety Supervision," which describe ways to set up safety meetings and to apply the instructional material to individual plant situations. The text was written by Glenn Griffin of the University of Michigan's Bureau of Industrial Relations.

One of the texts, dealing with "Big Little Differences" in people, gives the foreman some good tips on safety education and how to handle people who are aggressive, "pushy", quarrelsome and accident prone.

There are also those who are slow learners and quick forgetters; others who keep things in a mess and invite accidents with their untidy operations.

What to do with these people? It has been proved many times that such workmen, if handled rightly, can become safe employees. How is it done? The NSC booklet outlines a practical program for helping people who keep having accidents without any apparent reason for such frequency. Such a program requires the following steps to be taken by the foreman:

1. First, the manager or superintendent talks to the man and assures him the company wants to help him. He is asked if he knows why he is having accidents. (These are often first-aid cases, and the man usually says that he didn't know he was having more accidents than anybody else. Almost always, he says that he doesn't know why.) The manager then asks him to cooperate in a plan to help him.
2. The second step is a physical examination. The man is checked for a likely cause, such as poor eyesight or defective hearing. Treatment, where indicated, is started.
3. The safety man or the superintendent, the man himself, and his foreman then go over the individual's job and discuss possible accident causes. This should be a three-man interview, not just the man and the foreman. If any hazardous physical condition is found, it is corrected right away.
4. As the next step, the man is enrolled in some kind of course or is asked to go to a series of meetings. A first-aid course is good; so is a safety course, if one is available. Otherwise, he can attend the safety committee meetings. In any case, it is essential that he attend regularly and take part.
5. Finally . . . for several months at frequent intervals, the superintendent or the safety man visits the man on the job, asks him how he is getting along, compliments him on not having any more accidents.

The amazing fact about this simple program is that it works. Probably, it works for different people for different reasons. Some may be helped by being made aware of the problem and of the company's interest in it. Some may be helped by treatment of defects picked up on the physical exam, some by the experience of talking to the foreman about the job, some by the follow-up visits. Probably all these factors work together. Whatever the reason, accident-repeaters who undergo this program often cease being accident-repeaters.

Incidentally, if a person has a deep-seated personality fault of the sort that might indicate a need for psychiatric care, some evidence of it is likely to be seen in these interviews, and the doctor who makes the physical examination can then refer the person to a specialist.

Forty-Mile Spur Track To Serve Potash Mine

THE IMPORTANCE played by transportation in modern production considerations is pointed up in the king-sized "spur" track scheduled to be built by the Denver and Rio Grande Western Railroad to serve the new Texas Gulf Sulphur Co. plant at Moab, Utah. According to reliable estimates, the railroad expects to spend about $5 million to construct this 40-mile spur. Some of the obstacles to be overcome in the project is a 1.4-mile railroad tunnel, second only in length to the Moffat tunnel which bores through mountainous terrain for 6 2 miles. Of significance, also, is the fact that this "spur" will be the longest section of new track for the railroad since 1905 at which time it constructed a 48-mile line in New Mexico.

Texas Gulf's plant at Moab is expected to produce 1.5 million tons of potash each year when the operation gets in full swing. TGS presently is drilling a core hole test to a depth of 3,000 ft. at the site of the proposed mine.

With a production prospect of this nature, it is not difficult to see why a railroad company would be willing to lay track for about 40 miles to get that business. At the potash plant there will be trackage sufficient to hold 140 cars for loading at one time, it has been reported.

Freight rates are the subject of frequent discussion between the fertilizer industry and the major carriers. The industry, shipping some 25 million tons of fertilizers each year, could fill some 625,000 railway cars, which could form a train nearly 5,000 miles long. This is big tonnage in any language. In view of this kind of patronage, it seems odd that rail carriers should keep adding pressure on the industry for better rates.

The fact that this one western road is willing to invest millions in building what amounts to a major piece of railroading as a "spur" to get the business of a single firm in the fertilizer industry, is eloquent of the importance with which carriers of this type regard the tonnage provided them by this trade.

SALES MANAGER DIES

WILMINGTON, DEL. — Clarence E. (Ky) McKay, 63, of Hercules Powder Co., a veteran in naval stores industry activities for many years, died in Wilmington on Jan. 26. At the time of his death, Mr. McKay was sales manager for turpentine in Hercules' Naval Stores Department. He would have observed 45 years of service with Hercules in February.

More and more fertilizer manufacturers are turning to DRI-SOL ammoniating solutions as a sure, time-tested way to lower production costs and improve mixed-fertilizer quality.

For in addition to the eight cost-saving and quality-building advantages shown above, DRI-SOL can also help manufacturers offset the high water content of low-strength acid. It also helps to produce grades which are difficult or impossible to make with conventional solutions.

What grade of DRI-SOL meets your needs best? From a wide choice of formulations you can select the solution that offers you the greatest number of advantages. Each grade contains less than 0.5% water. Grades range from 24% ammonia and 76% ammonium nitrate, to 50% ammonia and 50% ammonium nitrate, and are generally available in all the Southern and Midwestern States.

Why not get complete information? Technical data to fertilizer manufacturers available upon request. Write: Agricultural Chemicals Department, Commercial Solvents Corporation, 260 Madison Avenue, New York 16, New York. Offices also located in: Atlanta, Shreveport, St. Louis.

COMMERCIAL SOLVENTS CORPORATION CSC

QUESTIONS — ANSWERS

From You — From Experts

QUESTION: My problems are two in number: 1. Crushing oversize in high analysis fertilizers. We are presently using a 10 h.p. hammermill and a roll crusher in parallel. The roll crusher has a 5 h.p. and a 7½ h.p. motor pulling. 2. Ammonia loss in ammoniator. We are presently using distributor pipes very similar to those recommended by the Tennessee Valley Authority. Our ammoniator is a 7'x10' TVA type—Ed Gibson, superintendent, Texas Farm Products Co., Nacogdoches, Texas.

ANSWER: (By A. B. Phillips, chief, Process Engineering Branch, TVA) While Mr. Gibson is not specific about his problem of crushing oversize in high-analysis fertilizers, we assume that he is having the usual difficulty with frequent clogging of his mills when running high-analysis grades. In our pilot-plant we have used a hammermill, a chain mill, and a roll mill at various times for this service. The chain mill has been the most satisfactory because it tends to be self-cleaning.

The roll has given good service but it tends to make "pancakes" instead of fines when used on plastic material. In one case when we needed to pulverize a plastic material to produce a large amount of fines, we used a roll mill followed by a cage mill with very good results. In commercial granulation plants all four of the mills mentioned above are used.

The chain mill is probably most common because it is relatively cheap and easily cleaned. The cage mill probably gives the finest grinding. When hammermills are used the gratings that are often supplied for the mill discharge are almost always removed because they aggravate the problem of buildup in the mill. We improved the performance of a large hammermill recently by increasing the speed and the horsepower. This should be done only after consulting the manufacturer, however, since excessive speed can be dangerous.

Regarding ammoniation loss in the ammoniator, there are many possible causes for this condition. Furthermore, poor ammoniation is not always to blame when the product is low in nitrogen. The real cause of nitrogen deficiency may, in many cases, be decomposition of ammonium nitrate during processing or even failure to add enough nitrogen because of metering difficulties or off-specification raw materials. Poor ammoniation is easily blamed because even a small ammonia loss is readily detected by odor while decomposition products of ammonium nitrate are very hard to detect. Several years ago we, at TVA, did quite a lot of work on loss of nitrogen in the continuous ammoniation process. The results of this work were discussed at a meeting held at TVA in June, 1959, and were widely reprinted in the trade journals. Briefly, our results led to the following recommendations for reducing nitrogen loss in grades that contain ammonium nitrate:

1. Use distributors that extend throughout the full length of the ammoniator.
2. Use distributors designed to give maximum distribution of liquids. Distributors should be slotted or should contain a large number of small holes rather than a few large ones.
3. Distributor and supporting members should be of streamlined design to minimize interference with the rolling action of the bed.
4. Formulations and operating conditions should be adjusted to avoid overgranulation to the extent that mixing would be impaired.
5. Distributors should be inspected and cleaned frequently. They should be replaced before the openings are enlarged to the extent that the distribution pattern is changed. The acid distributor requires particular attention as it is subject to the worst corrosion. Hastelloy C is a recommended material for acid distributors.
6. Formulations giving excessive heat of reaction should be avoided.

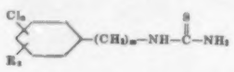
NEW ACCEPTANCE

NEW YORK—The U.S. Departmnt of Agriculture has accepted the use of 4% malathion dust for the control of lice, ticks, and keds on sheep and goats. Malathion has previously been accepted as a 57% emulsifiable liquid in controlling these pests, according to its maker, American Cyanamid Co. The new use allows applications to be made in dust form directly to the backs and necks of certain farm animals, the company says. Repeat applications can be made after two or three weeks if needed.

PRODUCTION PROCESS PATENTS

2,967,101

Defoliant Compositions. Patent issued Jan. 3, 1961, to Philip C. Hamm, Webster Groves, and Norman J. Lewis, Kirkwood, Mo., assignors to Monsanto Chemical Co., St. Louis. A plant defoliant composition comprising from 0.01 to 10% by weight of a compound having the formula:



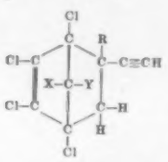
wherein *m* is an integer from one (1) to two (2), *n* is an integer from zero (0) to three (3), *x* is an integer from zero (0) to two (2) and R is an alkyl radical having up to three (3) carbon atoms; from 0.1 to 5 percent of a wetting agent; and the balance being a fluid carrier.

2,967,127

Toxicant Carrier and Pesticidal Composition Containing Same. Patent issued Jan. 3, 1961, to Edgar W. Sawyer, Jr., Metuchen, and James A. Polon, Milltown, N.J., assignors to Minerals & Chemicals Philipp Corp. A deactiviated carrier for a thiophosphate-type toxicant comprising a sorptive clay having sorbed thereon triethylene glycol, ethyl silicate and an alkylated phenol.

2,967,126

Production of Pesticidal Compounds. Patent issued Jan. 3, 1961, to Alfred A. Levin and Hyman M. Molotsky, Chicago, Ill., assignors to Velsicol Chemical Corp., Chicago. A compound of the formula:



wherein X and Y are selected from the group consisting of chlorine and hydrogen atoms and R is selected from the group consisting of a hydrogen atom and the radical —CH_3.

A method of destroying undesirable fungi which comprises contacting said fungi with a fungicidal composition comprising an inert carrier and as the essential active ingredient, in a quantity which is injurious to said fungi.

2,968,528

Process for Producing Clarified Phosphoric Acid. Patent issued Jan. 17, 1961, to Raymond E. Tuttle, William W. Harwood, and Donald J. Smalter, Lakeland, Fla., assignors to International Minerals & Chemical Corp., Skokie, Ill. The method of clarifying concentrated acidic phosphorus-bearing solution selected from the group consisting of wet process phosphoric acid and solutions of mixtures of monocalcium phosphate and wet process phosphoric acid predominated by phosphoric acid which comprises mixing into said acidic solution successively with agitation, from about 0.5% to about 2.0% by weight of an oxidizing agent selected from the group consisting of nitric acid, potassium permanganate, potassium dichromate, hypochlorous acid, and mixtures thereof, agitating the mixture for a period of from about 3 minutes to about 10 minutes, subsequently adding from about 0.08 pound to about 0.3 pound per ton of said acidic solution of a flocculating agent stable in strong acid solution selected from the group consisting of water-soluble high molecular weight synthetic polyacrylamide resin, water-soluble high molecular weight hydrolyzed synthetic polyacrylonitrile resin, and the potassium and sodium salts thereof, and mixtures thereof, holding the mixture at a temperature of between about 180° F. and about 200° F., and separately recovering a clear acidic fraction and a solids carrying fraction.

2,968,543

Process for the Preparation of Composite Fertilizers Containing Phosphate. Patent issued Jan. 17, 1961, to Hugo Nees, Cologne-Brueck, Walter Buettgens, Cologne-Vingst, and Karl Geirsberger, Cologne-Deutz, Germany, assignors to Chemische Fabrik Kalk G.m.b.H.

The process of producing phosphate-containing fertilizers in which the ratio of calcium other than sulphate, to the phosphorus pentoxide present is from 1.5 to 2.4 which consists in decomposing crude phosphates with a mixed acid containing nitric acid and at least one acid from the group consisting of sulphuric and phosphoric acids, ammoniating the resultant mixture and during the ammoniation when the pH is between 2.5 and 6.4, adding a soluble compound of a stabilizing metal selected from the group consisting of magnesium, aluminum, and cobalt in such quantity that it amounts to from 4 to 8 gram-molecules of said stabilizing metal ions to 100 gram-molecules of the total quantity of phosphorus pentoxide present and continuing ammoniation to complete neutralization.

2,963,359

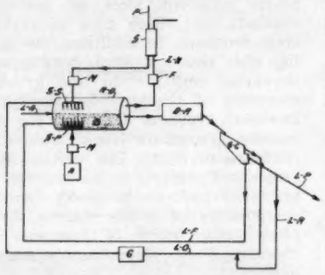
Process of Manufacturing Di-Ammonium Phosphate. Patent issued Dec. 6, 1960, to George F. Moore and Thomas Beer, Tampa, Fla., assignors to Tennessee Corp., New York.

An improved wet process of directly producing substantially dry, solid, granulated di-ammonium phosphate having a composition of approximately 18-47-0

$(N\text{-}P_2O_5)$

and constituted of substantially uniform granules containing product size comprising minus 10 mesh to plus 14 mesh which comprises establishing a substantially horizontal-moving, rotating, solid bed of at least about 7 inches and not more than about 36

inches of contacting solid particles of di-ammonium phosphate in a rotating reactor-granulator having an inlet at one end and an outlet at the other; the bulk of said particles having fineness within a range of sizes of about minus 10 to about plus 60 mesh with the remainder containing



minus 60 mesh, said particles furnishing sufficient carrier and supply surface for liquid phosphoric acid and to furnish nuclei for granulation introducing a feed supply of said di-ammonium phosphate having the aforesaid fineness via said inlet of said reactor-granulator to maintain said horizontal, rotating solid bed of contacting particles; rolling the contacting solid particles in said solid bed over and over to cause contacting of adjacent particles and to cause a rolling action of the particles and a movement substantially horizontally from said inlet to said outlet of said rotating reactor-granulator; feeding liquid phosphoric acid of the wet acid process type over the contacting solid particles in said horizontal, rotating, solid bed to cover and wet substantially the entire surfaces of said contacting particles with liquid films of said acid; said films contacting each other between adjacent contacting particles to form a solid bed; simultaneously diffusing ammonia vapor upwardly from near the bottom through said bed of wet contacting particles and through the liquid films on and around the surface of said wet contacting particles at a velocity insufficient to separate said contacting particles of di-ammonium phosphate, said phosphoric acid and ammonia being proportioned to each other to provide ammonia in excess of the stoichiometric amount required for the neutralization of said liquid phosphoric acid of the wet acid type and the formation of coatings of solid di-ammonium phosphate of approximately 13-47-0

($N\text{-}P_2O_5$)

composition; controlling the pH in the solid bed containing said wet contacting particles from more than about 7.0 to less than about 8.0; controlling the temperature within said solid bed to one effective to drive off water as steam at about 212° F. at atmospheric pressure; withdrawing escaping unreacted ammonia vapor in excess of stoichiometric amount from said solid bed; passing said escaping unreacted ammonia vapor coming from the top of said solid bed through a scrubber; absorbing said ammonia in liquid phosphoric acid of the wet acid process type in said scrubber to neutralize said excess ammonia vapor and to prevent the escape and loss thereof and to provide partially neutralized phosphoric acid; recycling said partially neutralized liquid phosphoric acid and feeding it into said reactor-granulator for wetting contacting particles in said solid bed; withdrawing from said outlet of said rotating reactor-granulator directly-produced, substantially dry, solid particles of di-ammonium phosphate having a composition of approximately 18-47-0 ($N\text{-}P_2O_5$) in an amount corresponding approximately to the amount of feed-supply; recovering a minor fraction of said withdrawn solid, granulated particles covered with films of newly formed di-ammonium phosphate whereby a finished product of di-ammonium phosphate having a composition of approximately 18-47-0

($N\text{-}P_2O_5$)

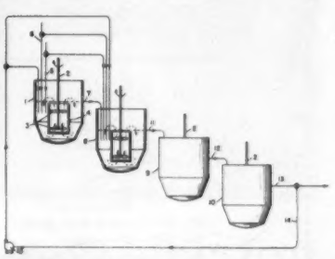
is produced as a substantially dry product without an appreciable loss of ammonia; and recycling a major fraction of said withdrawn particles having a range of sizes of about minus 10 mesh to about plus 60 mesh through the aforesaid operations to provide feed-supply of di-ammonium phosphate particles to be introduced into the inlet of said reactor-granulator to maintain the said horizontal, rotating, solid bed; said recycled particles being approximately three times the amount of the minor fraction of withdrawn product whereby said 18-47-0

($N\text{-}P_2O_5$)

di-ammonium phosphate is produced with a substantially negligible loss of ammonia and as constituted of substantially uniform granules containing product size comprising minus 10 mesh to plus 14 mesh.

2,968,544

Methods and Means for Dissolving Crude Phosphates with Acids. Patent issued Jan. 17, 1961, to Willi Zeitz, Koln-Deutz, and Hugo Nees, Koln-Bruck, Germany, assignors to Chemische Fabrik Kalk, G.m.b.H., Cologne-Kalk, Germany. A process of dis-



solving uncalcined crude phosphate, comprising mixing the crude phosphate with strong inorganic acid selected from the group consisting of nitric acid, sulphuric acid, phosphoric acid and mixtures thereof in one of the first two vessels of a series of interconnected mixing vessels through which the reaction mixture flows successively, conducting a portion of the reaction product back from the last vessel of the series to one of the first two vessels of the series and in maintaining the reaction mixture in at least one of the first two vessels of the series a continuous circulation from the bottom to the top in the central zone of the vessel and from the top to the bottom in the zone adjacent the wall of the vessel beside the rotation of the reaction mixture around the center of the mixing vessel.

2,968,545

Process for Producing Phosphate-Containing Fertilizers. Patent issued Jan. 17, 1961, to Hugo Nees, Koln-Bruck, and Martin Schmidt, Koln-Kalk, Germany, assignors to Chemische Fabrik Kalk, G.m.b.H., Koln-Kalk, Germany. The process of producing a complex fertilizer contain-

Turn to **PATENTS** page 32

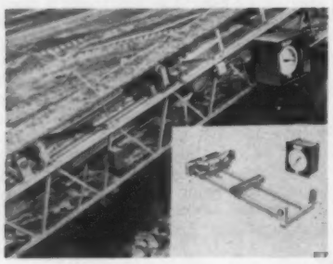
WHAT'S NEW

IN PRODUCTS · SERVICES · LITERATURE

To obtain more information about items mentioned in this department simply: (1) Clip out the entire coupon in the lower corner of this page. (2) Circle the numbers of the items of which you want more information. Fill in the name and address portions. (3) Fold the coupon double with the return address portion on the outside and fasten the edges with a staple, cellophane tape or glue. (4) Drop in the mail box.

No. 9323—Automatic Conveyor Scale

Ramsey Engineering Co. offers a new conveyor scale which it says automatically weighs, measures, meters and/or controls the flow of bulk materials on conveyor belts. Called the Vey-R-Weigh, the device is designed to control applications in any operation where bulk materials are transported by conveyor. The unit is said to be adaptable to many measure-



ments, densities, and feed rates. Various types of controls can be provided for remote recording by tape or punch card readout, the makers say.

The device consists of a conveyor mounted idler supported carriage installed to support one idler in the conveyor which weighs the belt and material carried on that idler, and a remote indicating and recording instrument which may be mounted in any convenient location up to 500 feet from the carriage. Convenient adjustments for zero and calibration are contained within the instrument, and a range of full scale capacities from 8.6 to 250 lb. per foot of belt are available for standard models, the company says. For full information on this device, check No. 9323 on the coupon and mail.

No. 9327—Flowable Insecticide

Stauffer Chemical Co. has announced the development of a flowable formulation of the insecticide, Sevin. Stauffer says it is instantly dispersible in spray machinery, even in low agitation type units often used in airplanes.

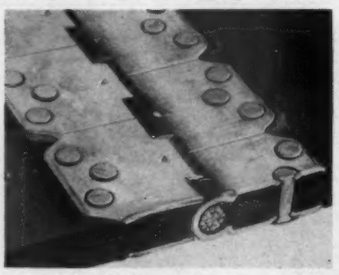
Heretofore, Sevin has been available only as a wettable powder, the bulletin says. The Stauffer flowable formulation contains four pounds of Sevin per gallon. Sevin combines high toxicity for insects with long residual life and low toxicity to humans, warm blooded animals, birds and fish. According to its makers, it has also proved to be effective in the control of a number of insects which have developed resistance to other insecticides. For additional information on the new flowable insecticide, check No. 9327 on the coupon and mail.

No. 9319—Super-Seal Motors

Allis-Chalmers Manufacturing Co. has issued a recent bulletin entitled "Super-Seal Motors" giving full details on its line of motors built for operating under severe industrial conditions such as those found in fertilizer and pesticide plants. A copy of the bulletin numbered 05-51B9040B is available by checking No. 9319 on the coupon and mailing.

No. 9321—Reversible Belt Splice

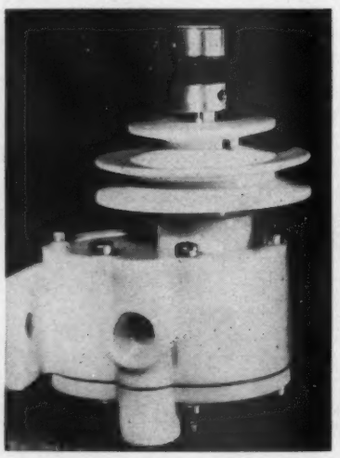
General Splice Corp. offers a new reversible belt splice which it says is designed for quick, simple installation. The heavy duty, hinge-type "Minet" splice is said to eliminate the need for templates, drilling or hole punching. Its design permits in-



stallation of the splice in one piece. The manufacturers say that the one-piece design assures closest possible fit, resulting in a tight, leak-proof but flexible joint. The makers also state that the method of fastening, employing pointed rivets which separate but do not cut and weaken belt fabric, give the splice considerable extra strength. They also say that the hinge-type splice with heavy duty, reusable pin, can go smoothly around small diameter pulleys and makes adding or removing belt sections a simple operation. Full information on the belt splice is available by checking No. 9321 on the coupon and mailing.

No. 9324—Plastic Pump

Artag Plastics Corp. has introduced a new type of pump, said to be capable of pumping any liquid. The makers say that all major parts of the pump, including the housing, gears, bearings, cover plate, relief valves and drive sheave, are molded to close



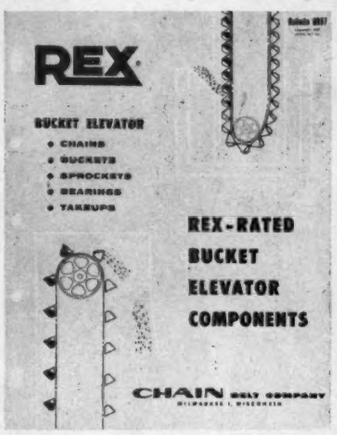
tolerance by Artag, employing a new thermo plastic material. This particular plastic was chosen because of its being dimensionally stable, tough or tougher than most metals, and is unaffected by most chemicals. Maintenance costs are said to be reduced to a minimum through use of this pump, and other benefits, the makers say, lie in its efficiency, lack of heat build-up, quiet operation, long life and improved bearings. For full information on this pump, check No. 9324 on the coupon and mail.

No. 9320—Crushers

The Robinson Division of Young Machinery Co., Inc. has just issued an illustrated technical catalog on the firm's line of horizontal sawtooth and vertical cone crushers. The bulletin, designated as C-360A, provides full design and dimensional data for seven different sizes of sawtooth crushers and three sizes of vertical cone crushers. In addition, the catalog also shows closeup photographs revealing construction and grinding elements of the devices. Horizontal sawtooth crushers are made for processing phosphate rock and other chemical products. The vertical cone crushers, according to the makers, are primarily used for crushing chemical components of softer nature. Complete information is available by checking No. 9320 on the coupon and mailing.

No. 9318—Bucket Elevator Components

Chain Belt Co. has a new 24-page bulletin designated as No. 6057P containing simplified selection charts and informational aids for selection of centrifugal and continuous discharge elevator components. It contains basic data on chains, buckets, sprockets, bearings and take-ups. The compo-



nent selections outlined in the bulletin provide an inter-related series of balanced units engineered for modern bucket elevation operations, the makers state. The selection procedures and tables furnished are based on years of experience by the makers on elevator component design and application. For full information on the subject, check No. 9318 on the coupon and mail.

No. 9326—Insecticide

Fairfield Chemicals is making available through representatives and nationwide sales offices its silica dust insecticide, "Dri-Die." The material is a finely powdered residual insecticide that controls crawling insects by dehydration. The product is offered either alone or in combination with pyrenone. It is equally effective against resistant and non-resistant insects, the makers state. It is also harmless to humans and warm blooded animals when used as directed. Complete information on the properties of "Dri-Die" is available by checking No. 9326 on the coupon and mailing.

No. 9316—Fire Detection

Descriptive literature, including copies of a report by the Underwriters Laboratory, is being offered for the Thermotec Model 302 thermostat, a device which is supposed to increase efficiency of any fire detection installation with a patented action of unusual sensitivity. This sensitivity is claimed to afford a response pattern heretofore considered impossible because of its ability to automatically sort out normal temperature changes from actual fire conditions. The device is used as a re-

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Send me information on the items marked:

- ☐ No. 9316—Fire Detection
- ☐ No. 9317—Tractor-Drawn Spreader
- ☐ No. 9318—Bucket Elevator Components
- ☐ No. 9319—Super-Seal Motors
- ☐ No. 9320—Crushers
- ☐ No. 9321—Reversible Belt Splice
- ☐ No. 9322—Bag Shaker
- ☐ No. 9323—Automatic Conveyor Scale
- ☐ No. 9324—Plastic Pump
- ☐ No. 9326—Insecticide
- ☐ No. 9327—Flowable Insecticide
- ☐ No. 9328—Bulk Fertilizer Plants
- ☐ No. 9330—Granular Impregation Unit

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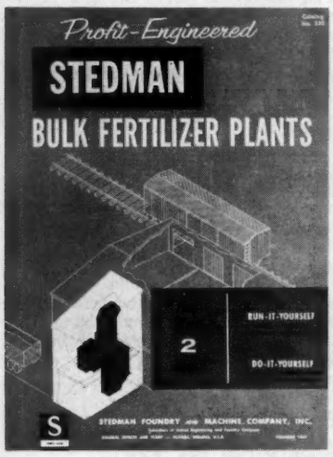
placement element in present systems to modernize them. It also is used as an element around which new installations may be designed. Tomorrow, Inc., the firm offering copies of literature on the subject, states that its unique design makes the Model 302 thermostat relatively unaffected by moisture, dust, vibration and paint build-up. For complete information, check No. 9316 on the coupon and mail.

No. 9328—Bulk Fertilizer Plants

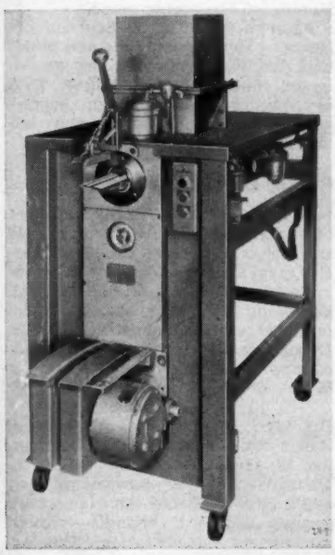
Stedman Foundry and Machine Company, Inc. has recently issued a new catalog, No. 520, describing the details of its "profit-engineered bulk fertilizer plants" designed as 1-man, 15-ton or 2-man, 30-ton per hour



units. Details of these bulk blending units are pictured in schematic drawings in the catalog for easy comprehension of how the various plants operate. A copy of the bulletin is available by checking No. 9328 on the coupon and mailing.

No. 9322—Bag Shaker

E. D. Coddington Mfg. Co. offers a new bag shaker for use on valve bag packers. According to descriptive literature by the company, this accessory consists of two shaker arms powered by a small built-in electrical motor. This causes a reciprocal mo-



tion of the arms in contact with the bottom of the bag. This agitation of the bag throughout the entire filling operation causes the material to settle quickly into its most compact form. The shaker is attached to the front panel on the scale and a counterweight is provided to compensate for scale balance. It can be adjusted to accommodate bags of various lengths.

The electric motor is connected into the wiring circuit of the packer, with a flexible cable so as not to interfere with the movement of the scale. The bag shaker starts and stops automatically as the packer is operated so that the agitation is continuous, rather than during just part of the time bags are being filled. Full particulars on the new automatic bag shaker are available by checking No. 9322 on the coupon and mailing.

No. 9317—Tractor-Drawn Spreader

Henderson Mfg. Co. has announced the availability of its tractor-drawn fertilizer spreader, designated as Model TD-100. Among features pointed out by the makers are a stainless steel conveyor driven from a hub-mounted gear box providing constant poundage application per acre, regardless of the speed of the tractor. Twin spinners are driven by tractor power takeoff or optional gasoline engine drive. The spreader has a capacity of two tons of pelleted fertilizer, and can carry four tons by means of side extension available as optional equipment.

The device has mounted tandem axles with coil springs. Twin spinners have angle tilt to insure accurate spread pattern of 24 feet to 30 feet in width. For full information on the spreader check No. 9317 on the coupon and mail.

No. 9330—Granular Impregnation Unit

The John Williamson & Sons Co. has announced the availability of its new batch formulating plant for pesticide granules. The makers say that the package plant plan calls for complete equipment for mixing, liquid injection, screening and packaging. Plant units are available in several sizes, and suitable for domestic or export shipment, the makers say. For full details on the unit, check No. 9330 on the coupon and mail.

New Office Building Being Built by Atlas

WILMINGTON, DEL. — Construction of a new one-story office building is now underway on the property of Atlas Powder Co. near Joplin, Mo., according to Max E. Colson, vice president. Located on a 2½ acre tract outside the main gate of Atlas Plant, it will be of modern brick, aluminum, and safety glass construction and is due for completion in May, 1961. Space will be provided in the building for marketing personnel of Solar Nitrogen Chemicals, Inc. Solar, whose ownership is shared equally by Atlas Powder Co. and The Standard Oil Co. (Ohio), is erecting a new anhydrous ammonia-urea plant in the area.

Designed by Atlas' Central Engineering Department, the office building will contain some 10,000 square feet of space with its own parking facilities and cafeteria.

209 Attendants Hear Research Reports at North Carolina's Annual Pesticide School

RALEIGH, N.C.—Research reports highlighted the 13th annual Pesticide School, held Jan. 10-11 at North Carolina State College. The program attracted 209 formulators, manufacturers, dealers and others from the pesticide industry, the record high enrollment of the course.

Following registration, Kenneth R. Keller, assistant director of tobacco research, North Carolina Agricultural Experiment Station, delivered the welcoming address. "The Pesticide Industry and Community Responsibility" was the topic of P. J. Reno, sales manager, Hercules Powder Co., Wilmington, Del.

Prof. M. H. Farrier of the college's Entomology Department presided over the opening session devoted to entomology. One of the reports offered was on alfalfa weevil control, delivered by Prof. W. V. Campbell of the entomology department.

Prof. Campbell stated that alfalfa weevil, the most serious pest of alfalfa in North Carolina, can be most effectively controlled with fall applications of granular pesticide.

"Application on Oct. 15," he stated, "prevents the establishment of adult weevils, thus eliminating egg laying which normally commences in mid-November." Furthermore, he added, the October treatment results in no detectable residues on the first or subsequent cutting of alfalfa.

The Tuesday afternoon session covered weed control. State College faculty members and researchers presented reports on their findings in the field.

Prof. Frank L. Selman, Department of Feld Crops, discussed new developments in weed control for cotton, peanuts and soybeans. Pre-emergence herbicides have shown promise for use in cotton production and are widely used in North Carolina.

Further testing is necessary before any recommendations can be made concerning these herbicides, he said.

Increased use of pre-emergence herbicides in cotton production has led to an interest in a herbicide to be applied at lay-by time to insure a clean field for harvesting. Experiments are being conducted concerning this problem.

In peanut research, Prof. Selman pointed out that the experimental success with combinations of herbicides in controlling weeds and grasses without injury to peanuts will result in a more intensified study of this method of herbicide application.

Prof. E. O. Beal of the botany department gave a progress report on a project initiated in 1956 under the auspices of the North Carolina Agricultural Experiment Station to study marsh and aquatic plants in North Carolina. He said that such field work represents about 45,000 miles of travel covering each of the 100 counties of the state over a five-year period.

Prof. J. W. Hardin of the Botany Department spoke on poisonous plants in North Carolina, approximately 150 of which cause internal poisoning to livestock. Of these 150, about 35 are considered most dangerous in North Carolina.

Gus D. Hertogh, field crops research, discussed residual behavior of herbicides in soils, emphasizing the outlook for future research in the area and the need for proper application of compounds.

SOIL SAMPLING ON INCREASE

MOSCOW, IDAHO — About 2,125 soil samples were tested by the University of Idaho during the 1960 crop year, Charles Painter, soils specialist of the extension service, has reported. The period covered is July 1, 1959, to June 30, 1960. Number of samples was slightly less than average for the last five years. Mr. Painter said an increase for the current year is indicated by substantial boosts in several counties.

More than 7,000 individual tests were made on the samples.

Plant Back in Operation for 1961

PINE BLUFF, ARK. — Planters Fertilizer & Soybean Co. of Pine Bluff will be back into production well in advance of the 1961 season after its plant was almost completely destroyed in a fire April 15, 1960. The fire destroyed the building housing the company's bulk storage facilities and most of the granulation facilities.

A completely new storage building, over 300 ft. in length and about 150 ft. in width, has been completed, and new granulation facilities are in operation.

Additional loading facilities and a second bagging unit are almost completed, and will be prior to the beginning of the spring season.

Planters Fertilizer & Soybean Co. has not only completed the new buildings, but also has added new granulation equipment, including a TVA ammoniator cluster weigh hopper, automatic bagging units and improved loading facilities.

BDSA Division Aide

WASHINGTON—The appointment of James V. Richards, an official of the Bemis Bro. Bag Co., Brooklyn, N.Y., as assistant director for mobilization planning, containers and packaging division, business and defense services administration, U.S. Department of Commerce, was announced recently by William A. White, Sr., BDSA administrator.

Mr. Richards, manager of the Brooklyn general sales division of Bemis Bro., is on loan to BDSA under an arrangement by which industry makes the services of key executives available for temporary service—usually six months—without government compensation. This assignment also qualifies him for membership in the National Defense Executive Reserve, which would staff the operation of a production agency in event of national emergency.

MISSISSIPPI ELECTION

BILOXI, MISS. — Ed Freeman of Marks, Miss., was elected president of the Mississippi Seedsmen's Assn. at the group's recent convention here. He succeeds Ted Cheshire of Jackson. Elbert Lott of Yazoo City was named vice president and S. R. Evans of Greenwood secretary-treasurer.

Back to Manhattan

Big Chief Kay-Two-Oh is headed back to Manhattan Island. It's not that the Paleface has decided to give Manhattan back to the Indians . . . just that the Chief feels that he can better serve his many customers from new sales offices in a towering tepee in the heart of the asphalt jungle.

You are cordially invited to drop by for a few puffs on the peace pipe whenever you are in the neighborhood, but at any time remember that the P.C.A. Chief's services are as close to you as your nearest tom-tom. Call New York, LT 1-1240, or TWX NY - 1 - 5386.

If you've got a problem the Chief can help you solve, he's always glad to tell you "How".

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PERSONNEL NEWS

To Head Chemicals Division Of Olin Mathieson Corp.

NEW YORK—John O. Logan has been appointed general manager of the Chemicals Division, Olin Mathieson Chemical Corp., it was announced Jan. 20 by Stanley de J. Osborne, president.


John O. Logan

A corporate vice president, Mr. Logan succeeds the late Edward Block as manager of the largest of Olin Mathieson's six operating divisions. He formerly was associate general manager.

Headquarters of the Chemicals Division is in Baltimore, Md.

A native of Alton, Ill., Mr. Logan attended Shurtleff College in that city. He received a B.S. degree in 1931, with majors in chemistry and mathematics.

Mr. Logan joined Mathieson Chemical Corp. in 1931 as an assistant in the research department at Niagara Falls, N.Y. Sales manager for industrial chemicals when Olin and Mathieson merged in 1954, he was later named a corporate vice president.

Mr. Logan holds several U.S. patents on pulp bleaching and generation of chlorine dioxide. He is a director of the National Agricultural Chemicals Assn. and other business groups.

Department Heads Named

KANSAS CITY—Two new assignments at Spencer Chemical Co. were announced following the resignation of Max W. Foresman, director of public and employee relations. L. E. Stollenwerck, formerly manager of public relations, becomes director of public relations. He joined Spencer in 1950 as a public relations representative.

In the other assignment, Virgil S. Hanson, formerly manager of employee relations, becomes director of employee relations. Mr. Hanson joined Spencer in 1947 as an administrative assistant.

The resignation of Mr. Foresman follows completion of arrangements by him to enter the citrus growing business in Riverside, Cal. He has been a Spencer employee since 1947, when he joined the company to organize and direct its public relations and employee activities.

●

Becomes Vice President

ATLANTA, GA. — Davidson-Kennedy Co., Atlanta machinery manufacturer, has named Tom C. Campbell vice president. He will also serve as president of Manufacturers Products Co., a wholly owned subsidiary. The announcement was made by Thornton Kennedy, Davidson-Kennedy president.


Tom C. Campbell

A native of Tullahoma, Tenn., Mr. Campbell attended Georgia Tech and graduated from the U.S. Military Academy at West Point. While on active duty he served as aide-de-camp to General Douglas MacArthur's Chief of Staff.

Mr. Campbell is a registered professional engineer, a member of American Society of Mechanical Engineers and other professional organizations. In his new capacity he will direct sales for Davidson-Kennedy, designer and manufacturer of machinery for the fertilizer and other industries.

●

To New Fertilizer Posts

RICHMOND, CAL.—C. E. Cody, western regional manager of the Ortho Division of California Chemical Co., recently announced two promotions in connection with the company's western fertilizer operation. Richard B. Price was named regional products manager with John M. Hayden filling the position of assistant manager. Both will be headquartered at the western regional office in Richmond, Cal.

According to Mr. Cody, the newly created positions are part of the company's over-all expansion in the fertilizer field. A new fertilizer facility, being built by California Chemical Co. in Fort Madison, Iowa, is scheduled for completion late next year.

Mr. Price was formerly assistant supervisor, fertilizer sales-West. Mr. Hayden moves to Richmond from the Whittier, Cal., office where he was assistant district manager.

●

Davison Personnel Changes

NEW YORK — Appointment of Harry K. Stueber as export sales manager, agricultural chemicals, is announced by D. N. Hauseman, vice president, W. R. Grace & Co. Davison Chemical Division.

Mr. Stueber has had intensive sales experience in Latin America and Europe. He is fluent in several foreign languages. In his new post he succeeds William M. Rohrer, now assistant general sales manager, agricultural chemicals.

Davison has also announced that Mark H. German has succeeded Basil Wagner, Jr., resigned, as territory representative for Davison on agricultural chemicals, working out of Baltimore and covering the states of Illinois, Michigan, Wisconsin and Minnesota and the southeastern portion of Iowa.

Mr. German has been with Davison since 1954, formerly in the engineering department of the Florida Phosphate Division, more recently traveling Central America and West Indies.

●


Robert L. Baker, Jr.


John D. Richards


Philip C. McGrath


Louis J. Finn

Bemis Bag Changes

ST. LOUIS, MO—A new appointment and three retirements have been announced recently by Bemis Bro. Bag Co. Robert L. Baker, Jr. has been named sales executive in charge of the company's Cleveland sales office. He has been with Bemis for 25 years in various capacities.

The three retirements, all effective as of January 30, involve Louis J.

Finn, manager of the company's paper mill in Peoria, Ill.; Philip C. McGrath, special assistant to the director of sales in St. Louis; and John D. Richards, manager of the Seattle plant.

Mr. Finn joined Bemis in 1914 as a stenographer in the engineering department, worked his way up through various sales responsibilities, and became paper mill manager in 1949.

Mr. McGrath joined Bemis in 1913 as a general helper in the pressroom, became a salesman in 1917, and in 1953 became sales manager.

Mr. Richards joined Bemis in 1924 as a foreman and spent his entire career with the company in Seattle. He served as a salesman, became assistant superintendent in 1948, superintendent in 1950, and production manager in 1956. He has been manager of the plant and sales division since last June.

E. G. Muir, formerly assistant manager of the plant and sales division, will succeed Mr. Richards as manager.

●

Ammonia Plant Manager

SAN FRANCISCO—Shell Chemical Co. has named C. H. Plomteaux, Jr., as manager of its Shell Point ammonia plant near Pittsburg, Cal.

C. H. Plomteaux, Jr.

He replaces F. G. Watson who has transferred to the firm's New York offices as manager - manufacturing in the plastics and resins division.

Mr. Plomteaux was born in San Jose and graduated from University of California, Berkeley, with a degree in civil engineering. He started his career with Shell in 1940 as a junior engineer in the plant he will now manage.

He has served in various manufacturing posts for Shell Chemical in Texas, Louisiana and New York. He was made assistant to the vice president, manufacturing in New York in 1956. In 1959 he returned to the firm's plant in Houston as superintendent, the position he held prior to his move to the Bay Area.

●

Joins Witco Staff

NEW YORK—Witco Chemical Co., Inc., has announced the appointment of Henry M. Wogisch as general purchasing agent — containers and packages.

In his new post, Mr. Wogisch will be responsible for purchases of packaging supplies for all Witco divisions and wholly owned subsidiaries. His offices will be located at Witco headquarters in New York City.

Witco manufactures and markets a broad line of chemicals and allied products.

●

Retires from Cyanamid

NEW YORK—J. Miller Porter of the phosphate and nitrogen department of the agricultural division of American Cyanamid Co. retired on Jan. 1, after thirty-two years of service. He held various managerial positions with the company pertaining to research and chemical engineering, manufacturing, and administration. Most recently under his sales planning supervision were the Cyanamid products Aero Ammonium Sulphate, anhydrous ammonia and phosphoric acid.

J. Miller Porter

Mr. Porter at one time was plant manager of the company's Linden,

(Continues on page 18)

N.J. plant. He later served as a member of the board of directors for Cyanamid Products, Ltd. in London, England for five years. While in England he was assistant to the managing director of Cyanamid Products.

Prior to joining Cyanamid in 1928, Mr. Porter was with the U.S. Bureau of Standards in Washington.

●

Armour Announces Personnel Changes

ATLANTA, GA.—Several appointments in the nitrogen-phosphate division of Armour Agricultural Chemical Co. have been announced by R. L. James, company vice president and general manager of the nitrogen-phosphate division.

Frank Dunbar, of Atlanta, formerly assistant general superintendent of the fertilizer manufacturing firm, has been named manufacturing manager of the nitrogen-phosphate division. He joined the company in 1934.

H. E. Maune, former manager of Armour's Crystal City, Mo., plant, has been appointed project manager of the company's new ammonia and complex-fertilizer plant to be constructed near Sheffield, Ala. He will become manager of that plant when construction has been completed.

Grant F. Davis, formerly production manager at Crystal City, has been named manager of that ammonia and derivatives plant, to succeed Mr. Maune.

Both Mr. Maune and Mr. Davis joined the company in 1959, when the Crystal City plant was purchased by Armour from the Mississippi River Fuel Co., in Festus, Mo.

Harold N. Hedrick, who had been manager of Armour's phosphate plant in Bartow, Fla., has assumed the duties of works manager of all the company's phosphate rock operations in Florida. He joined Armour as a mechanical engineer in 1950.

George Gagel was named project manager of Armour's new triple superphosphate plant to be constructed in Polk County, Fla., and will become manager of that plant when construction has been completed. Formerly production manager at the Bartow plant, he joined the company in 1948 as superintendent of the sulphuric acid unit of the phosphate mining operation.

W. D. Whatley has been named manager of the triple superphosphate plant in Bartow, to succeed Mr. Hedrick. Formerly manager of the plant's chemical operations, he joined Armour in 1949 as a foreman in Nashville, Tenn.

To Pittsburgh Position

PITTSBUGH — Appointment of Robert E. Widing to the newly-created position of manager of manufacturing for Pittsburgh Plate Glass Company's chemical division (formerly Columbia-Southern Chemical Corp.) has been announced by J. E. Burrell, general manager of operations, for the chemical division.

Mr. Widing will headquarter in the company's Pittsburgh general office, transferring from the chemical division's Barberton, Ohio, plant where he had served as assistant works manager since 1956. He joined the Barberton plant in 1942 as a chemical engineer and in 1949 was assigned to Pittsburgh as technical assistant to the general superintendent of Columbia-Southern. Mr. Widing was named chief process engineer in 1952, and transferred to Jersey City, New Jersey, as works manager in 1954.

●

Link-Belt Appointment

CHICAGO—Erwin A. Wendell has been appointed manager of advertising and public relations for Link-Belt Company, with headquarters at the company's executive offices in Chicago, it was announced by D. E. Davidson, vice president.

The appointment follows the retirement of Bertram V. Jones, advertising manager for the past ten years and a member of the advertising department since 1923.

Mr. Wendell joined the company in 1917.

●

Geigy Appoints Salesman

ARDSLEY, N.Y. — Geigy Agricultural Chemicals, Division of Geigy Chemical Corp., has announced the appointment of D. L. Odle as its Iowa representative.

Mr. Odle graduated from Kansas State University where he received his degree in agricultural education.

He worked on his father's livestock and grain farm near Stockton, Kansas, before serving with the armed forces.

New Latin American Office

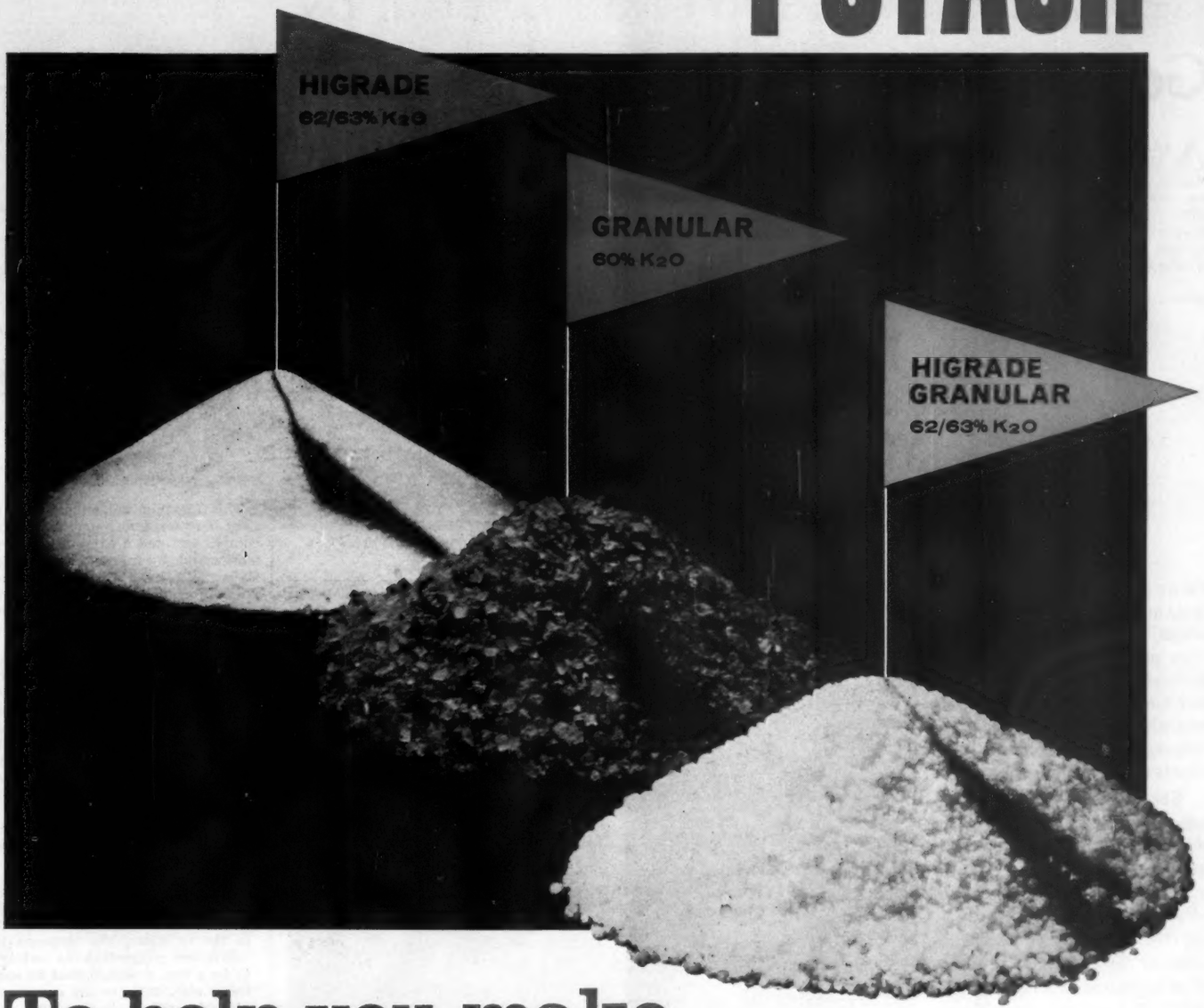
MUNCY, PA. — Harold J. Alsted, vice president in charge of sales, of Sprout, Waldron & Co., Inc., has announced that the company's sales program in Latin America is now under the direction of Gerald R. Senra, who has recently established headquarters for that purpose in San Antonio, Texas.

The advantages anticipated by this move are, according to Mr. Alsted, having close to the Mexican market, the direction of all sales aimed at the entire Latin American market.

Lawrence Southwick

HEADS WEED GROUP—Lawrence Southwick, Dow Chemical Co., Midland, Mich., was elected president of the Northeastern Weed Control Conference at the group's annual convention in New York in January.

For you-- 3 types of specially sized POTASH



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U.S. BORAX

The scoop jockey who runs his front-end loader Through the plant wall is likely to join the ranks Of ex-employees. But how do you handle good men Who make mistakes involving less damage?

Can You Increase Worker Output by Going Easy on Employee Criticism?

ALL EMPLOYEES make mistakes . . . some more than others. How do you deal with workers who need correction? Methods differ widely, of course. Tone of voice in reprimand may range from a quiet private talk with the offending individual, to a roaring torrent of vituperation and abuse calculated to "take the hide off" of the man involved.

Granted, there are occasions where mistakes in a plant may be costly and, viewed through the eyes of superintendents, inspire the righteous wrath of management to descend upon the head of the person responsible.

Since these occasions seem to happen with irritating frequency, it is appropriate to determine the best way to handle employee criticism. When good employees err, it is well worth finding a tactful approach to point out the way in which they are wrong, make suggestions for improvement, and to encourage better performance on the job.

Thus, it is necessary from time to time to correct employees. But it is also a fact that if the correction is done in the wrong way, the criticism may act as a boomerang. The corrected worker may not take the suggestion in the helpful manner it was intended, and more serious employee relations problems could develop.

It is never a pleasant task to criticize an employee. It can be an ulcer-producing problem that is avoided as long as possible. Then, when the breaking point has nearly been reached, the employee is criticized to release the tension.

Successful management men have found that there is an easy and effective system of correcting employees. This plan points out the error and makes a suggestion for improvement. Most important, however, is the fact that this formula usually holds the good will and the cooperation of the employee being corrected.

Reduced to an easy-to-apply formula for successful supervision, there are three steps to take in correcting your employees:

1. **Compliment**
2. **Correct**
3. **Encourage**

This formula sandwiches the criticism between two happy thoughts—a compliment and a word of encouragement. And, by following this formula there will be time to get into a friendly frame of mind rather than flying off the handle with quick words of criticism.

Compliment

A basic rule of this formula is to think of something good the employee is doing or has done in the past. It may take a few moments to think of this part of the formula, but this time helps take the edge from the supervisor's anger. And, if the employee has not been or is not doing anything that can be complimented, any effort on the part of management to offer corrective suggestions will be of little value.

The supervisor will find that compliments are more effective if they are based on something unrelated to the criticism. For instance, if a corrective suggestion on safety is to be given, a compliment on something else, such as his cooperative attitude will be better than mentioning his former safety record.

One suggestion fertilizer plant management makes about this part of the correction formula is: Don't be too brief in your compliment. If you do, it may sound like flattery rather than the compliment intended.

For instance, don't say: "Jim, you have a cooperative attitude, but . . ." This brief compliment doesn't have time to sink in and soften the blow of the criticism that is to follow.

Add substance to the initial compliment in the formula for criticism by citing a specific example. It makes the compliment more believable.

While thinking of the complete details of the example of the employee's cooperative attitude, the manager will have more time to develop a friendly approach, thus removing much of the sting.

Correct

Many supervisors have found that the criticism is accepted better by the employee when it is offered as a suggestion—not as a command. For instance, a correction will be prefaced with something like this: "May I offer a suggestion?"

Another idea that is helpful in applying the formula for criticism is to point out a benefit—something the employee will gain by following the suggestion. For example, one might stress the correct way is easier, faster, safer, etc. Any benefit that is

Turn to CRITICISM page 25

Arcadian® News

Volume 6 Nitrogen Division, Allied Chemical Corporation Number 2

Precautions for Handling Solutions in Cold Weather

Nitrogen Solutions with a high content of ammonium nitrate or urea salts are an economical source of nitrogen for production of high-nitrogen mixed fertilizers. But, certain precautions are required in handling these Solutions during cold weather, due to their tendency to "salt out."

Because of the high level of dissolved salts in these Solutions, their "salting-out" temperature is higher than that of Solutions containing more free ammonia or water. It is also higher than atmospheric temperatures during winter months in some areas.

The "salting-out" temperatures for all ARCADIAN® Nitrogen Solutions are shown in the specification chart on another page of the ARCADIAN News.

These are the Solutions' temperatures at which crystals begin to form. Crystallization of nitrogen salts does not start until the temperature of the Solution actually reaches the "salting-out" or "saturation" point.

Accurate Laboratory Tests

The exact "salting-out" point of each Solution is determined in the Nitrogen Division laboratory by gradually cooling the Solution until crystals start to form. "Salted-out" samples are then warmed and dissolution points of crystals are checked against previously-determined "salting-out" temperatures, to avoid any possibility of inaccuracy due to super cooling.

Nitrogen Division technicians chill the Solution until crystals occupy much of the visible Solution space. The Solution is then warmed and its temperature at the disappearance of the last crystal is determined. The test is then repeated with very slow warming as the indicated dissolution temperature is approached.

When the "salting-out" temperature is obtained by this method, there is no possibility of salt deposition above this temperature. Slightly below this temperature, only incipient crystal formation is possible. Crystallization increases progressively as the temperature is lowered further and only at much lower temperatures will the Solution freeze solid.

Temperatures Change Slowly

Solution temperatures actually respond very slowly to changes in atmospheric temperature. Tank-car quantities of Solution must be exposed to low atmospheric temperatures for considerable periods of time before the Solution temperature will drop to atmospheric temperature.

The amount of solids that crystallize are in proportion to the temperature drop below the saturation point, and crystals dropping out of solution lower the "salting-out" point of the remaining liquid.

Openings in spray pipes and lines in the fertilizer plant are usually of sufficient size to enable Solutions carrying small amounts of crystals to flow without difficulty.

The table shows the amount of salt which will separate from two NITRANA® Solutions at various temperatures below the "salting-out" point.

In practice, Solutions are often successfully handled and tank cars are completely unloaded, when atmospheric temperatures are considerably below "salting-out" temperatures. In such cases, it is important to avoid allowing Solutions to remain stagnant in pipe lines and equipment for a prolonged period. If there is to be a delay in operation, the system should be purged immediately.

Safety First!

Explosions or fires can be caused by applying heat with flame or electricity to

(continued on following page)

APPROXIMATE POUNDS OF SOLID SALT FROM 100 POUNDS SOLUTION WHEN COOLED BELOW THE SOLUTION "SALTING-OUT" TEMPERATURE

SOLUTION	"SALTING-OUT" TEMPERATURE	DEGREES BELOW "SALTING-OUT" POINT 5°F	10°F	15°F	20°F
NITRANA 4	56°F	2 lbs.	6 lbs.	8 lbs.	10 lbs.
NITRANA 4M	61°F	2 lbs.	5 lbs.	7 lbs.	9 lbs.

(continued from preceding page)

equipment which contains nitrogen solutions or even very small amounts of residue from nitrogen solutions. If you need heat to free piping of "salted-out" blockage, the safest heat to use is hot water or low-pressure steam.

Some operators heat the compressed air that is used to move nitrogen solutions, with the belief that this will conserve heat in the storage tank. This practice is ineffective and dangerous. The air carries very little heat and most of this is lost in the small pipe line. When high heat first contacts ammonia in the presence of air, there is always the danger of an explosion. Very hot air can cause an explosion in the pipe line, in the tank and even in the air compressor.

During cold weather, ARCADIAN Nitrogen Solutions arrive at your plant in well-insulated tank cars which usually stay warm until you have used the contents, when a few simple cold weather practices are utilized. This may involve working overtime to empty the car so that it will not lose heat overnight or over the weekend. Insulating the solutions pipe line is a tremendous help in cold weather handling.

Ten Helpful Suggestions

The following suggestions will assist you in more efficient handling of NITRANA®, URANA®, and U-A-S® Solutions during cold weather:

1. When atmospheric temperatures are expected to be below "salting-out" point, do not transfer solution to storage tanks but use directly from tank car. Ammoniating Solutions are loaded hot and Nitrogen Division tank cars are well insulated.

2. Insulate pipe lines wherever practical. Use the best insulation obtainable—but even dry burlap is better than no insulation.

3. When supply pipes are cold, do not introduce solution until mixing machinery has been started and the first charge of fertilizer is actually in the mixer. Then try to keep solution moving with a minimum of delay between charges. If for any reason delay is anticipated, blow the solution out of the measuring tank and out of pipe lines. Equipment should be arranged for blowing the solution back into the tank car or the storage tank.

4. After mixing operations have stopped and lines are cleared of solution, disconnect feed lines at tank car. This will avoid the filling of the piping through any leak in the shut-off valve.

5. Keep gauge glasses and gauge glass connections warm with electric heating devices or with electric lights. Infra lamps prove quite effective.

6. It is advisable to have gauge glasses and connections of at least ¾-inch size.

7. Use shortest feed lines practicable. Eliminate unnecessary bends and constrictions. Install enough union-connections for convenient dismantling of lines for cleaning. Install tees or crosses instead of ells at bends to permit cleaning with rods or stiff wires. The branches of tees should be upward. There should be no sags or dips in the line. Provide for complete drainage.

8. Unless necessary, do not vent air from tank car until unloading is completed, since this is a cooling action.

9. Equip solution lines with water connection for cleaning. If warm water is available, use this for cleaning and also to warm up feed lines and tank car valves before introducing solution. Completely plugged lines should be opened sufficiently by rodding to permit some water to be forced through in order to speed solution of the salt.

10. Avoid leaving small amounts of nitrogen solutions in the tank car overnight. A little overtime work may help you avoid a lot of trouble.

Advantages of Bulk Fertilizers

The practice of selling bulk fertilizers to farmers is rapidly gaining in popularity. This method of handling automatically favors heavier application per acre and greater total sales. And the larger farmers who are the best fertilizer customers often prefer the bulk system for a large part of their tonnage. Where bulk service is good, many farmers use it even where the products offered in bulk are inferior to those offered in bags.

Save Time and Labor

Handling fertilizers in bulk provides definite savings in time and labor for farmer, dealer and manufacturer. Where bulk fertilizers are handled mechanically, farmers are less apt to scrimp on recommended application rates per acre.

Many bulk truck and trailer units now on the market do an excellent job of spreading fertilizer for plow-down or top-dressing. Self-unloading feed and grain wagons are being designed for the additional job of handling fertilizer. Portable bins, hauled on trucks or wagons, are being used for fertilizer as well as for crops. New fertilizer broadcasting equipment is being designed with larger hoppers, and many farmers and dealers are also improvising bulk fertilizer equipment. New planters and drills come equipped with bigger hoppers located for convenient filling from bulk as well as from bags. Hauling equipment is also being adapted for easy mechanical unloading into fertilizer hoppers on planters.

The large investment needed for specialized bulk equipment helps to discourage the part-time dealer and the in-and-out price opportunist. Dealers who have invested in fertilizer-handling equipment must concentrate on doing a better job of merchandising to protect this investment. They are more inclined to stay active every year, to develop stronger and more stable markets. The natural result is a stronger distribution system built around better service.

The need for custom application of much of the bulk fertilizer tonnage is no real handicap to bigger sales. Efficient, large-scale custom equipment enables good operators to apply fertilizer at low cost per ton. The farmer is often happy to be relieved of the job. Many a custom operator finds that his close contact with the farmer helps him do a better all-around job of sales and service.

Arcadian News for Fertilizer Manufacturers from Nitrogen Division, Allied Chemical

Flow Meters for Ammonia

To measure ammonia accurately, and to assure trouble-free operation when you use ammonia, a flow meter has to be properly designed for this specific job. Liquid ammonia is anhydrous (water-free) ammonia held at a temperature and pressure that make it a liquid instead of a gas. At 70°F, it takes 114 pounds pressure per square inch (at gauge) to keep ammonia in liquid state from boiling.

Four Major Problems

Ammonia has four characteristics that often cause trouble in flow measurement. They must all be considered in design and installation of a practical flow meter for anhydrous ammonia:

1. Ammonia has very poor, almost no, lubricating quality.
2. Ammonia is extremely corrosive to copper and its alloys such as brass.
3. The pressure of ammonia must be kept above saturation value at any given temperature of the liquid—or—the temperature must be below the saturation value at any given existing pressure.
4. Ammonia has very low, practically no electrical conductivity which makes it impractical to measure through a magnetic flow meter.

The poor lubricating value of anhydrous ammonia makes a positive displacement type meter a poor choice. Even when made of corrosion-resistant materials, the moving parts of such a meter that are in contact wear rapidly. This quickly reduces accuracy of measurement. Displacement type meters usually allow a great loss of pressure which causes flashing of the ammonia.

The velocity type flow meters with a rotating cage may show undesirable wear of the bearings, but they have low pressure loss and excellent accuracy of measurement. One design on the market has sealed bearings to reduce wear.

The old stand-by, the orifice meter, has fair to good accuracy, depending on the quality of the installation and on the differential measuring device used. Pressure loss in this kind of meter can be minimized by proper orifice and pipe design and by use of a special low differential pneumatic transmitter.

On the score of flow meter accuracy, a measurement variation of ¼ per cent or less from actual flow is considered excellent, ¼ to ½ per cent variation is very good, ½ to 1 per cent good, and 1 to 2 per cent is fair.

The biggest problem in anhydrous ammonia flow measurement is in the temperature-pressure relationship. If the natural pressure of the anhydrous ammonia is used to move it, you get partial vaporization of the liquid at each point where (1) the temperature is raised slightly, or (2) the pressure is reduced slightly, or both. The bubbles formed by the vapor disperse through the liquid, and the increased volume is measured by the meter as liquid moved. For example, a flow meter reading may show 1,000 gallons of anhydrous ammonia moved when you actually had 900 gallons of anhydrous ammonia plus 100 gallons of vapor bubbles.

One satisfactory system of measurement for ammonia has a turbine meter in a system where the ammonia is pressurized by an inert gas to a higher level than the saturation pressure of the ammonia for a temperature at which the ammonia stays liquid. In another plant, the liquid ammonia is cooled below the temperature that is normal at the actual pressure of the ammonia.

Any flow meters of suitable non-corrosive materials, designed to handle a non-lubricating fluid, can be used for liquid anhydrous ammonia if the pressure is kept above saturation value, or if the temperature is kept below saturation value.

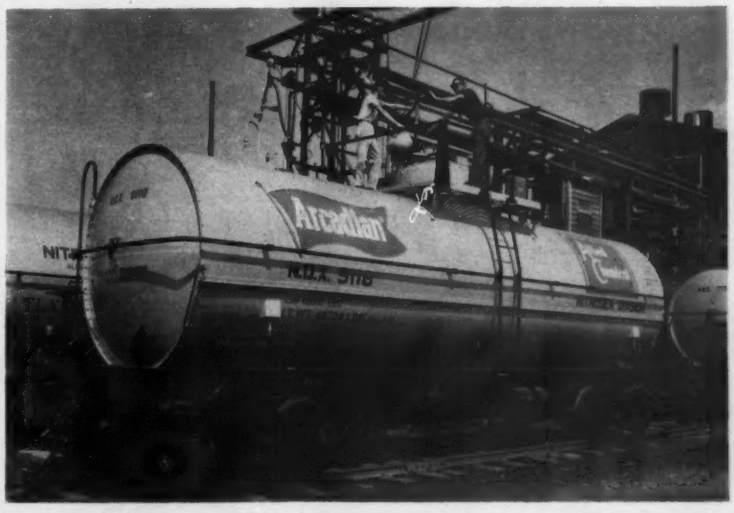
Temperature-Pressure

Use this table as a guide to maintain temperature and pressure of liquid ammonia at the proper relationship for accurate flow metering. Remember that at low temperature, the vapor pressure of anhydrous ammonia is low. At zero degrees, its vapor pressure is less than 16 pounds per square inch.

Temperature in Degrees F.	*Pressure in Pounds per Square Inch*
0	15.7
20	33.5
40	58.6
60	92.9
80	138.3
100	197.2

To add pressure: Find the saturation pressure of the ammonia at the flowing temperature. Add the maximum expected amount of pressure loss through the meter, then add an additional 20 pounds per square inch pressure.

To reduce temperature: Find the saturation temperature at the flowing pressure. Subtract enough degrees temperature to equal the expected loss through the meter and also subtract an additional 10°F.



READY TO ROLL. In addition to operating the largest fleet of tank cars in the industry, Nitrogen Division, Allied Chemical Corporation, has geared all of its facilities and operations to rapid delivery of ARCADIAN Nitrogen Solutions to help you meet production schedules. The goal is *on-time* shipment every day.

Arcadian® NITROGEN SOLUTIONS

	CHEMICAL COMPOSITION %						PHYSICAL PROPERTIES		
	Total Nitrogen	Anhydrous Ammonia	Ammonium Nitrate	Urea	Water	Neutralizing Ammonia Per Unit of Total N (lbs.)	Approx. Sp. Grav. at 60°F	Approx. Vap. Press. at 104°F per Sq. In. Gauge	Approx. Temp. at Which Salt Begins to Crystallize °F
NITRANA®									
2	41.0	22.2	65.0	—	12.8	10.8	1.137	10	21
2M	44.0	23.8	69.8	—	6.4	10.8	1.147	18	15
3	41.0	26.3	55.5	—	18.2	12.8	1.079	17	-25
3M	44.0	28.0	60.0	—	12.0	12.7	1.083	25	-36
3MC	47.0	29.7	64.5	—	5.8	12.6	1.089	34	-30
4	37.0	16.6	66.8	—	16.6	8.9	1.184	1	56
4M	41.0	19.0	72.5	—	8.5	9.2	1.194	7	61
6	49.0	34.0	60.0	—	6.0	13.9	1.050	48	-52
7	45.0	25.3	69.2	—	5.5	11.2	1.134	22	1
URANA®									
6C	43.0	20.0	68.0	6.0	6.0	9.3	1.180	12	39
6M	44.0	22.0	66.0	6.0	6.0	10.0	1.158	17	14
10	44.4	24.5	56.0	10.0	9.5	11.0	1.114	22	-15
11	41.0	19.0	58.0	11.0	12.0	9.2	1.162	10	7
12	44.4	26.0	50.0	12.0	12.0	11.7	1.087	25	- 7
13	49.0	33.0	45.1	13.0	8.9	13.5	1.033	51	-17
DURANA®									
DURANA contains 8% formaldehyde.	37.0	13.3	53.4	15.9	9.4	7.2	1.235	0	36
U-A-S®									
A	45.4	36.8	—	32.5	30.7	16.2	0.932	57	16
B	45.3	30.6	—	43.1	26.3	13.5	0.978	48	46
[illegible]	82.2	99.9	—	—	—	24.3	0.618	211	-108

Other ARCADIAN® Products: URAN® and FERAN® Solutions • Ammonia Liquor • N-dure® A-N-L® • Ammonium Nitrate • UREA 45 • Nitrate of Soda • Sulphate of Ammonia

When you purchase your nitrogen requirements from Nitrogen Division, Allied Chemical, you have many different nitrogen solutions from which to select those best suited to your ammoniation methods and equipment. You are served by America's leading producer of the most complete line of nitrogen products on the market. You get formulation assistance and technical help on manufacturing problems from the Nitrogen Division technical service staff. You benefit from millions of tons of nitrogen experience and the enterprising research that originated and developed nitrogen solutions.

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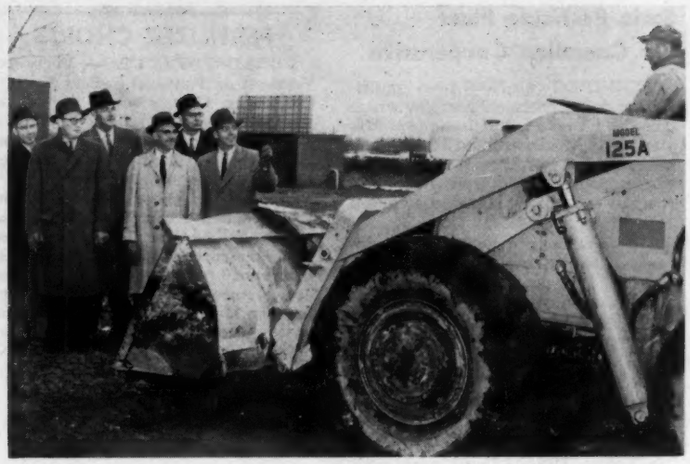


COMMENCEMENT EXERCISE—Initial phase in the construction of pesticide research center for Niagara Chemical Division of Food Machinery & Chemical Corp. begins as company and community officials watch topsoil being stripped at its Middleport, N.Y., site. Participating in the groundbreaking ceremonies are (left to right): Lloyd R. Coster of Niagara; Charles H. Porter, of Royalton-Hartland Central School; Stuart Bear of Niagara; Elton Birch, mayor of Middleport, and Drs. Oscar Johnson and Robert L. Gates of Niagara.

CRITICISM

Continued from page 20

easily seen by the employee can be used in this part of the corrective formula.

Thus, in this step of the formula one might say: "I want to offer a suggestion. I think you will find it a lot easier and less dangerous. Here, let me show you."

Next, show the employee the correct way to perform the task. This should be done slowly so the employee will not consider it too complicated and the suggestion will be lost.

While performing the operation the manager should stress the main point. For instance, if safety is to be stressed, be sure the performance is handled safely.

Finally, nail down the correction. One way is to have the employee repeat your performance in the approved way. You check to be sure it is done correctly.

Or, if it is a verbal suggestion, ask a positive question that gets agreement. For example, say, "Don't you agree this way is easier?"

Encourage

Some of the sting can be taken out of your criticism by ending with a word of encouragement. The employee is not left with the feeling he is inadequate—he develops confidence that he can do better in the future.

One technique used is to compliment the employee on something from the past. For instance: "I know you can do this faster. You have been one of the top men in the department and I'll bet you will be leading again."

Another helpful technique in this part of the formula is to repeat the benefits. For instance, after one has shown the faster, safer and better way of performing the task, one might again mention what the employee will gain. For instance, in the verbal suggestion, one can say to the plant employee: "Don't you agree that this is an easier, faster and safer way to do this?"

Fertilizer plant management at all levels will find that this formula accomplishes the task—corrects the employee—and still maintains a cooperative spirit among the employees.

Niagara Breaks Ground For New Research Center

MIDDLEPORT, N.Y.—Groundbreaking ceremonies for its new research center were staged here recently by the Niagara Chemical Division of Food Machinery & Chemical Corp. The occasion marked official commencement of work on the facilities which are expected to be ready for occupancy by October, 1961.

In a comment made during the special ceremony, Stuart Bear, manager of Niagara, referred to the project as a "significant advance in the effort to provide American agriculture with safe, economical and effective pesticides." The new center, to be equipped with the latest scientific apparatus, will engage in a search for new and improved materials for the control of a wide range of insects, weeds and plant diseases.

Included in the unit will be laboratories for identification and measurement of chemical residues, a modern organic synthesis section, and extensive biological screening and formulating laboratories.

Niagara representatives participating in the groundbreaking ceremony included: Mr. Bear; Dr. Oscar Johnson, assistant to division manager; Dr. Robert L. Gates, director of research; Dr. Norman Krog, assistant to director of research; Lloyd R. Coster, manager technical chemicals department, and project manager, T. Lubieniecki of FMC's chemical divisions' central engineering department. A number of local dignitaries also attended, including Elton Birch, mayor of Middleport, and Francis Whittaker, Town of Royalton supervisor.

Magazine's 75th Anniversary Issue Lauds Chemical Use

BIRMINGHAM, ALA.—"Farm Chemicals Open the Door to Plenty" is the title of a two-page feature article in the 75th Anniversary issue of The Progressive Farmer for February, 1961. Articles about the use of fertilizers and pesticides on specific crops and for more profitable farming are a feature of this issue and appear in every issue of the magazine.

In the 75th Anniversary issue the editors have summarized the ways chemicals help the farmer, as well as making a brief capitulation of farm investment in fertilizers, insecticides, herbicides and fungicides. They point out that the average operator of a 360-acre farm makes an investment of more than $11,000 per year in chemicals and makes it pay off in substantial extra profits.

New Phosphate Plant Begins Operation

KELLOGG, IDAHO — A $225,000 anhydrous liquid phosphate plant built by the Collier Carbon and Chemical Corporation of Los Angeles was to start operation here early in February, the Bunker Hill company has announced.

The liquid phosphate plant is built adjacent to the Bunker Hill company's 130-ton a day phosphoric acid plant which went into production in January after a seven-month delay caused by a labor dispute. The acid plant was completed last June.

Bunker Hill and the Los Angeles firm have entered into an arrangement for Bunker Hill to produce the acid, anhydrous liquid phosphate. It will be manufactured exlusively for Collier using a new process and plant design developed by that firm.

No capacity has been announced but earlier announcements of the plant said it would require a "substantial portion of the Bunker Hill phosphoric acid plant's manufacturing capacity."

Bunker Hill also has phosphoric acid contracts with several other fertilizer manufacturers.

Buys Applicator Firm

AUGUSTA, ARK.—The Mid-Continent Aerial Sprayers and Dusters, Inc., headquartered at Hayti, Mo., has purchased Agricultural Flight, Inc., of Augusta, it has been announced. The transaction involved the sale of six airplanes and other property.

Mid-Continent has operated agri-McGrory and Fair Oaks, Ark., the past two years. It has leased the Joe Stanley landing strip and will expand it- operations in the state.

Sandy Womble is area manager for the firm. Agricultural Flight was owned by a group of farm operators in the Augusta region.

Basic Pesticide Plant For Canadian Cooperative

WINNIPEG, CANADA—A multi-million dollar chemical complex which includes Canada's first basic pesticide plant will be constructed in the Saskatoon area this spring, George Urwin, president of Interprovincial Co-operatives Ltd., Winnipeg, announced Jan. 19.

The new facility will consist of a caustic-chlorine unit, a basic agricultural chemical processing plant and a chemical formulating plant. Mr. Urwin estimates that the new plant will be capable of meeting much of Western Canada's demand for herbicides.

Since 1953, Interprovincial has formulated pesticides at its St. Boniface, Manitoba plant. It has supplied farmers across Canada with herbicides, insecticides, rodenticides, fumigants and other agricultural chemicals.

FERTILIZER CHOICE

BURLINGTON, VT. — Forty-five Vermont agricultural leaders from 14 Chittenden County towns decided to promote the use of $95,525 in Federal aid in the area for tree planting, lime spreading, fertilization and drainage for soil conservation.

Members of the group, elected by their respective communities, have an option on deciding how the annual Federal appropriation will be used in the county for conservation purposes.

The meeting was conducted by Algeron Heald, state executive officer of the Agricultural Stabilization Committee.

Fertilizer Conference Conducted in S. Carolina

COLUMBIA, S.C.—With Governor Ernest F. Hollings appearing on the opening program, a meeting of fertilizer manufacturers, dealers and salesmen was held Jan. 12 at Hotel Wade Hampton in Columbia. The meeting was sponsored by Clemson College. Dr. M. D. Farrar, Clemson dean of agriculture, presided.

In addition to Governor Hollings, other speakers included Dr. R. C. Edwards, Clemson College president; Dr. Bruce D. Cloaninger of Clemson; D. H. Banks, Sr. of St. Matthews and Louis H. Wilson, director of information and secretary-treasurer of National Plant Food Institute, Washington, D.C.

Program speakers and their topics included: W. S. Funk of Columbia, "Agricultural Stabilization and Conservation"; Dr. T. S. Buie of Columbia, state conservationist, "Conservation and Use of Water"; Dr. U. S. Jones of Clemson College, "The Story of Fertilizers"; F. W. Atkinson of Hartsville, "Opportunities in the Fertilizer Industry"; and Dr. J. F. Reid of Atlanta, Ga. "Fertilizer Placement."

National Distillers Corp. Acquires Wisconsin Plant

NEW YORK — National Distillers and Chemical Corp. has purchased the Whitewater, Wis. mixed dry fertilizer plant of Wisconsin Farmco Service Cooperative. It will be operated by Federal Chemical Co., National's newly-acquired mixed fertilizer division.

This acquisition increases Federal's manufacturing facilities to seven. Other plants are at Louisville, Ky.; Humboldt and Nashville, Tenn.; Danville, Ill.; Butler, Ind.; and Columbus, Ohio.

Purchase price of the Whitewater plant was not disclosed.

Federal Chemical became part of National Distillers and Chemical in January. (January Croplife, page 6) National Distillers and Chemical is the second largest distiller in the United States and in addition to fertilizers, is a major manufacturer of polyethylene resins, industrial chemicals, plastics, and metals.

Pesticide School for South Carolina Feb. 28

SPARTANBURG, S.C.—The Tenth Annual Pesticide Chemical School is scheduled to be held at the Clemson House, Clemson, S.C., Feb. 28-March 1.

The two-day school will be under the joint supervision of Dr. J. H. Cochran, head of the department of entomology, and Dr. W. M. Epps, head of the department of botany and bacteriology. The program will get underway with registration on Tuesday morning at 9 a.m. The meeting will close at noon Wednesday.

Dr. Cochran and Dr. Epps pointed out that the school will be of interest to pesticide manufacturers, formulators, dealers and salesmen, county agents, vocational agricultural teachers, research and extensive personnel.

How Union-Camp's 5-Star Multiwall Plan increased a pallet payload by 400 lbs...without increasing its size!

A leading supplier of high density resins* had been packing his product in 50-lb. sewn-bottom multiwalls. This gave him an efficient, 40-bag (2,000 lb.) pallet load.

When he added a *low density* resin to his line, however, he found his existing bag wouldn't accommodate 50 lbs. of the new resin due to its increased volume. A slightly larger, sewn-bottom multiwall was tried, but this reduced the pallet payload to 32 bags (1,600 lbs.). Net "loss": 400 lbs. Net result: more handling . . . more trips to the warehouse . . . higher cost.

Heightening the pallets to 10 tiers instead of 8, offered no solution—they wouldn't pass through the existing archways. To say nothing of the problem of loading trucks and trailer cars.

New bag does the trick

At this point, the 5-Star Packaging Efficiency Plan went to work. Union-Camp multiwall specialists experimented with several different bag sizes and styles. Their solution—a multiwall with a *pasted* bottom and side gussets, a *rectangular*-shaped base—and 20 per cent more capacity!

With the new design, 50 lbs. of the low density resin can now be packed in each bag. Most importantly, the pasted bottom bags can be palletized five to a tier, eight tiers to a skid for a total payload of 2,000 lbs.—the same as the high density resins.

Warehouse space saved

The pasted-bottom bag offered several outstanding advantages. It permitted better use of warehouse space. It increased the yield per warehouseman to *1,000,000 lbs. a month.* And it initiated the development of a similar design for the company's high density resins, which could increase the present pallet payload to 2,500 lbs.

Space-saving secret is in bottom of bag. New design (left) with rectangular-shaped base has 20 per cent more capacity than sewn-bottom bag (right).

Works for you five ways

Apart from bag construction and materials handling, Union-Camp's 5-Star Plan covers bag design, packaging machinery and specifications control. An improvement in any one of these areas conceivably could result in substantial savings for you. In any case, it costs nothing to find out. See your local Union-Camp man for complete details.

2,000 pallet load of new, low density resin bags fits easily through existing doors.

FREE 16-PAGE BOOKLET

Write Dept. M-3 today for a free copy of Union-Camp's new 5-Star Plan booklet. It describes many case histories showing how packers like yourself have achieved greater efficiency and economy in their multiwall operation.

UNION-CAMP
MULTIWALL BAGS
Union Bag-Camp Paper Corporation · 233 Broadway N.Y. 7, N.Y.

* NAME ON REQUEST

AIR POLLUTION

Control Ammonia Fumes and Micro-Fine Dusts from Plant

Neighbors "Fume" When Plant Emits Ammonium Chloride From Stacks

PEOPLE WHOSE homes may be in fairly close proximity to fertilizer manufacturing plants are frequently bothered by either real or imaginary fumes and dust from the facility. They frequently complain bitterly to the management, to the city council, to air pollution committees, write letters to their local newspaper editors and bend the ear of anyone else who might lend them any sympathetic attention.

As a result, the fertilizer industry is frequently faced by unusual public relations problems particularly when the air pollution involves complaints against ammonia fumes and the micro fine portion of the dust stream. (For the most part, ammonium chloride.)

Thus, many manufacturers need to know more about auxiliary collection equipment to remove these undesirable materials of less than five microns in size, from their waste gas stream. They must turn to wet scrubbers which will operate in the low micron range where dry cyclones are ineffective.

Scrubbing

The goal of the wet scrubber is to provide a surface of liquid on which the particles to be removed can become attached. This liquid is then separated from the air stream in the form of droplets. Water is generally used as the scrubbing agent. Sometimes 3 to 5% sulfuric acid is added to neutralize any free ammonia. And it must be remembered that dilute acid concentrations are very corrosive to mild steel.

The technique of scrubbing makes use of a number of mechanisms designed to cause the separation of the small micron particles. These principles are:

1. **Impingement**
2. **Diffusion**
3. **Condensation**

The term "impingement" is used to describe dust particles impinging on a surface film of water when dust-laden gases sweep over a liquid. The dust particles are blocked by the liquid or water. The collection efficiency depends upon the degree of contact between the dust-laden gases and the moisture surfaces. This is perhaps one of the most common principles of wet scrubbing and is a characteristic of all wet scrubbing units. However, impingement is not very effective below the 5-micron size where ammonium chloride crystals fall.

Diffusion of dust particles: Dust particles intimately mixed with liquid droplets in a gas stream will be deposited on, or collect on, these droplets by Brownian diffusion or simple motion. This is the most suitable method of collecting sub-micron particles and dust up to 5 microns in diameter. Diffusion is the controlling action of the Venturi Dust and Mist Scrubber.

Condensation: If, in the case of ammonia or ammonium chloride fumes, a liquid spray causes the gas to pass through its dew point, condensation will result, with the smaller particles acting as nuclei. Of course, this mechanism is effective only when treating hot, humid gases.

There are four general-type wet scrubbers used in the fertilizer industry These are the **chamber scrubber, venturi scrubber, wet cyclone scrubber,** and the **dynamic precipitator.**

Chamber Scrubber

In the chamber scrubber. the exhaust gases are passed horizontally or vertically through banks of sprays which may be directed up or down into the gas stream. Directional baffles between banks of sprays are located in such a way as to create a directional change in the gas stream. Pressure drop is generally below ½ inch of water, and water consumption is less than two gallons a minute per 1,000 cfm. Superficial gas velocities through the chamber are on the order of five feet per second. The water jet scrubber is a modified form of the chamber scrubber. The jet scrubber is more expensive than the simple chamber scrubber described.

Chamber scrubbers are generally simply constructed, relatively inexpensive, involve no complicated mechanisms, and are normally most effective in removing particles above five microns in size. A number of

chamber scrubbers are now used by batch mixers to control the dust and fume problem from the mixer.

Venturi Scrubber

The venturi scrubber involves the introduction of low pressure water at the throat of a venturi, where the gas has been accelerated to velocities in the range of 200 to 300 feet per second. This results in the atomization of the liquid into a tremendous number of fine droplets. The high differential velocity between the gas and droplets causes impingement of the particles on the droplets. As the gas leaves the venturi and decelerates, further impaction and agglomeration of the droplets take place. The scrubbed gas stream then goes to an entrainment separator where the spinning gas stream drops out the water on the walls. The water with its particles drains by gravity, and the scrubbed air leaves from the top.

Units of this type are particularly effective in the 0.5 to 2.0 micron ranges. Water rates required are generally 5 to 7 gallons per 1,000 cfm.

The venturi scrubber, by nature of its operation, has the highest pressure drop of the wet scrubbers, 12 to 20 inches of water, thereby increasing horsepower requirements for its blower.

Cyclone Scrubber

The cyclone, or wet centrifugal scrubber, functions much the same as a dry cyclone dust collector. The difference is that water is introduced through various types of manifolds, spray heads, or devices which will insure intimate contact between the water and the gas. Air is introduced tangentially near the bottom of the scrubber and frequently directed counter currently to the flow of water. Water may be further brought into contact with the dust particles by keeping the collector surfaces or walls washed by spray nozzles. Here again, the water with the particles drains to the bottom of the scrubber, while the scrubbed air leaves at the top.

The water requirements for this type of scrubber are 3 to 5 gallons per 1,000 cfm. It has demonstrated good efficiency in removing particles in the 1 to 5 micron size.

Dynamic Precipitator

The wet dynamic precipitator uses water sprays within a blower housing and obtains precipitation of dust particles on the wet surfaces of the blower impeller. The water with its particles drops out in an expansion chamber downstream from the blower. No internal pressure drop is involved with this type of collector, however mechanical efficiency of the blower is reduced.

This type unit requires ½ to one gallon of water per 1 000 cfm and

is effective in removing particles in the 1 to 2 micron range. The efficiency of this unit does not vary with change of air volume which does effect the efficiencies of other wet scrubbers.

All wet scrubbers described here require certain auxiliary equipment, such as sludge tanks, water supply, water pump and, of course, the blower.

Dust collecting and scrubbing equipment costs vary of course in accordance with the cfm of gas handled and the gas volume involved. The smaller the volume, the higher the cost per cfm. Cost of each type of collector will vary as a result of different materials and weight of construction.

In general, dry cyclone dust collectors will cost 7 to 10¢ per cfm handled. The price of scrubbers for the 8 to 10,000 cfm range will range from 20 to 50¢ per cfm. For 20,000 cfm, they will cost 15 to 40¢ per cfm. For a desired application, a manufacturer's representative should be called in to get estimates for specific problems.

These methods and equipment illustrate how dust losses can be controlled. The control of air containing dust, water vapor, and chemical fumes has become most important in the control of fertilizer shrinkage, to say nothing of the community-relations problem. Both are quite difficult to determine in actual dollar costs. But it is certain that the community-relations problem can get involved in some pretty nasty situations. And also, losses due to poor dust control are a needless waste of material. With the increasing production of more concentrated fertilizers, this waste can amount to a surprisingly large sum of money.

—From "Processes to Profit" manual issued by International Minerals & Chemical Corp.

Herbicide Plant Begins 2,4-D and 2,4,5-T Production

MONSANTO, ILL. — Monsanto Chemical Co. has announced the start-up of a manufacturing plant here for 2,4-D and 2,4,5-T esters for broadleaf weed and brush control. The plant has been under construction since November.

Monsanto is ranked as the nation's largest 2,4-D and 2,4,5-T producer, and markets a complete series of liquid formulations varying in volatility for a variety of pre- and post-emergence applications.

NAMED MANAGER

PORTSMOUTH, OHIO — John Howard of Cincinnati has assumed his duties as the new manager of the Pyrrole Chemical Co. here. Mr. Howard received his degrees in chemistry from the University of Cincinnati and has been a chemical consultant in that city.

"Okay, okay . . . you have white sidewalls . . . so what?"

Retires From Allied

NEW YORK—Russell M. Jones, director of technical service for Allied Chemical's Nitrogen Division retired Jan. 31 after 30 years of service with the company. A pioneer in the synthetic nitrogen field, his contributions and influence have helped shape the commercial development of that industry.

Russell M. Jones

Mr. Jones participated in the early laboratory experiments with ammonia which permitted the commercial development of nitrogen solutions for agriculture, and also pioneered in the successful commercial use of ammonia in the pulping operation of the paper industry, and of nitrogen tetroxide as an oxidizer for rocket propulsion.

Mr. Jones has been director of technical service since 1958. Prior to this, he held positions in product development, sales and research. He also served as a chemist on the staff of the U.S. Department of Agriculture.

Fire in Fertilizer Plant Brings Arson Rap

EL CENTRO, CAL. — A quarter-million dollar fire destroyed the Swift & Co. Packing Corp.'s fertilizer warehouse in El Centro Jan. 29. The blaze consumed stores of ammonium phosphate and ammonium nitrate. Four persons were arrested in an arson investigation. The fire was the third in two days in the small town.

Fumes from the fertilizer fire caused the evacuation of about 500 persons from homes in the area. The fire was brought under control in about three hours.

Niagara Appointments

SAN FRANCISCO — Keith Rathbone has been appointed manager of technical service to sales in the San Joaquin Valley of California by the Western Agricultural Department of Niagara Chemical Corp.

New in the technical service department under Mr. Rathbone will be Donald H. Little.

William Wade was named manager of technical service to sales in northern and west central California, and James J. Kelsey was appointed to represent Niagara in Washington, Oregon, Idaho, Montana and Wyoming.

OHIO FERTILIZER GUIDE

COLUMBUS, OHIO — The Ohio Agricultural Extension Service has announced publication of its 1961 "Guide for Fertilizer Use in Ohio," containing recommended fertilizer rates for crops, information on how to take soil samples, and figures showing fertilizer ratios and minimum grades recommended for use in Ohio.

Ocean-Going Tanker Launched to Carry Molten Sulfur from Texas to East Coast

BALTIMORE, MD.—The S.S. Marine Sulphur Queen, an ocean-going tanker capable of hauling 15,100 tons of molten sulphur, was put into service here late in January. It is the first ocean-going vessel in the sulphur industry to be devoted exclusively to the transport of molten sulphur.

The vessel will be operated by Marine Transport Lines, Inc., New York, under long-term contract with the Texas Gulf Sulphur Co.

The Marine Sulphur Queen is a converted T-2 tanker and will be used by Texas Gulf to transport sulphur from its main storage and loading terminal at Beaumont, Texas, to two new molten sulphur terminals at Carteret, N.J., and Norfolk, Va.

The 523-ft. vessel has four separate insulated cargo tanks. For sulphur to remain fluid, it must be kept at a temperature of 275° F. The tanks are steam-heated by means of internal pipe coils fed by two boilers capable of producing 32,000 pounds of steam per hour. Need for constant temperatures is due to the peculiar physical characteristics of sulphur: below 240° F. it begins to solidify and above 320° F. it becomes viscous.

The new cargo carrier and the two new East Coast terminals represent important additions to Texas Gulf's over-all program of expanding shipments of sulphur in molten, or liquid form. TGS pioneered in volume shipments of sulphur in this form, and its terminal at Cincinnati, Ohio, which opened in 1959, was the industry's first terminal for public distribution of molten sulphur.

Until recent years, practically all sulphur had been shipped as a dry bulk commodity. Today, many sulphur consumers, notably large sulphuric acid producers, are said to prefer the molten product.

The company estimates that by the end of this year approximately 40% of its more than 2,000,000 tons of annual output will be shipped in molten form, or more than double the volume in 1960.

The Carteret terminal, operated by the Atlantic Sulphur Terminal Co., has a storage capacity of 26,000 tons, and the Elizabeth River Terminal Co. unit at Norfolk 20,000 tons.

The Marine Sulphur Queen can load or discharge its cargo at the rate of 1,000 long tons per hour. Modern loading facilities at the company's main shipping port at Beaumont will enable the ship to tie up, take on a full cargo direct from adjacent TGS mines or from terminal storage and be on its way in less than 15 hours.

APPROPRIATION MADE

SAN FRANCISCO — The State of California has appropriated $25,000 for emergency measures to control pear tree decline and the Department of Agriculture has asked that $35,000 be included in the 1961-1962 budget.

NEW RECORD SET FOR CANADIAN REGISTRATION

OTTAWA — Registration of pesticides with the Canada Department of Agriculture under the Pest Control Products Act hit an all-time high of 3,271 in 1960, according to W. S. McLeod, supervisor of the department's pesticide unit.

Of these 443 were new. Some others were registered for new uses. Previous high was 3,150 in 1956.

Mr. McLeod credited the increase in pesticides to greater interest of farmers in this form of protection for their livestock and crops. As knowledge of pest control methods increases, he said, so does the number of registered products.

Industry, he said, is submitting a steady flow of new chemicals which must be assessed by the unit to ensure that they comply with provisions of the Pest Control Products Act and are suitable for sale to the public.

The pesticides act makes clear to manufacturers conditions which must be met before a registration certificate is issued. The act also gives the Minister of Agriculture authority to refuse to register a pest control product if he believes it to be unsuited for the purpose claimed or to be detrimental to vegetation, domestic animals or public health when used according to directions.

BOLL WEEVIL CARRYOVER INCREASES IN FIVE STATES

CLEMSON, S.C.—Many more boll weevils entered hibernation last fall than during the fall of 1959 in cotton-growing areas of South Carolina, Louisiana, Mississippi, Tennessee and North Carolina, the U.S. Department of Agriculture reports.

Examinations of woods trash adjacent to cotton fields are made annually in the late fall and again in the spring by entomologists of USDA's Agricultural Research Service and cooperating states to get the number of weevils surviving the winter. The number surviving provides an estimate of the potential threat to the cotton crop.

In North and South Carolina, survey counts for the fall of 1960 were 104 to 209% higher in four sections of North Carolina and South Carolina.

In south-central South Carolina the average last fall was 3,308 compared with 1,318 in 1959. The Coastal Plain of the Carolinas averaged 13,148—up from 5,082 the previous fall. In Florence County, South Carolina, the average of 10,814 last fall was 1.97 times the average for the past 18 years and was topped only in 1955 during that period. In the Piedmont area of the Carolinas last fall's average was 8,954—about double the 1959 average.

PROCESS PATENTS

Continued from page 11

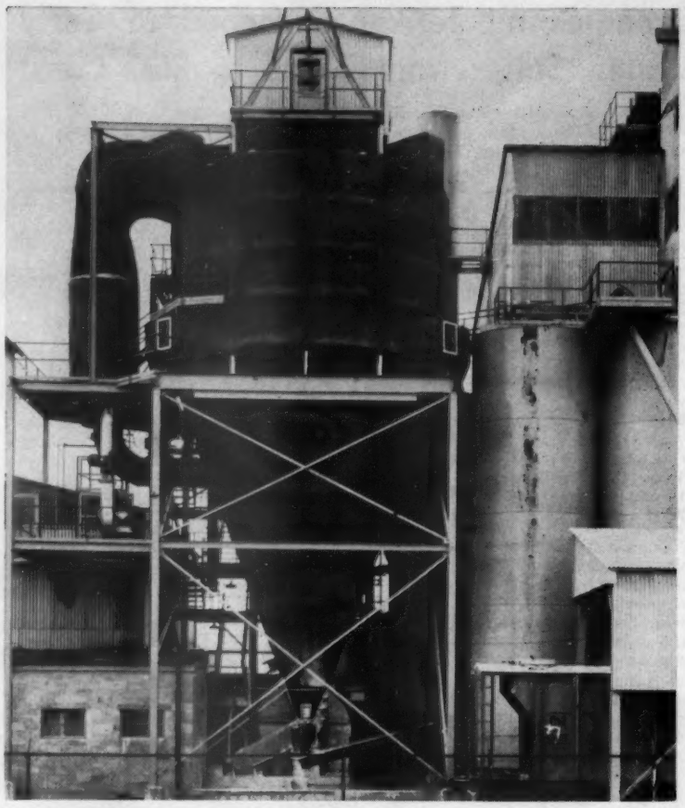
ing nitrogen in the form of nitrates and nitrogen in ammoniated form and phosphoric acid in the form of phosphates soluble in ammonium citrate which comprises treating phosphate rock with nitric acid in an amount sufficient to render water soluble practically all the phosphate initially contained in said phosphate rock, introducing into the disintegration mixture ammonia in an amount sufficient to render the mass to a pH not substantially less than pH 7 and during the ammoniation when the pH of the mass is between 2.5 and 6.7, adding to the reaction-mixture from 1 to 5 g-atoms of stabilizing metal ions selected from the group consisting of magnesium-, aluminum-, iron(II)-, and iron (III)-ions and mixtures thereof per each 100 moles of P_2O_5 present, adding to the reaction-mixture prior to the completion of the ammoniation sufficient ammonium salts selected from the group consisting of ammonium phosphate, ammonium sulphate and mixtures thereof to adjust the mole-ratio of CaO to P_2O_5 within the range of from 1.5 to 2.1, exclusive of such calcium which is present as calcium sulphate and calcium fluoride in the initial rock.

2,968,546

Process for Producing Phosphate-Containing Fertilizers. Patent issued Jan. 17, 1961, to Hugo Nees, Koln-Bruck, and Karl Geiersberger, Koln-Deutz, Germany, assignors to Chemische Febrik Kalk, G.m.b.H., Koln-Kalk, Germany. The process of producing a complex fertilizer containing nitrogen in the form of nitrates and nitrogen in ammoniated form and phosphoric acid in the form of phosphates soluble in ammonium citrate which comprises treating phosphate rock with nitric acid to render water soluble practically all the phosphate initially contained in said phosphate rock, cooling the disintegration mixture and crystallizing and separating calcium nitrate tetrahydrate from said mixture to adjust in the mother liquor a mole ratio of CaO to P_2O_5 within the range from about 1.5 to 2.1, not including such CaO present in the form of insoluble calcium fluoride initially contained in said phosphate rock, so that the quantity of soluble CaO present in the mother liquor is no larger than that required to form dicalcium phosphate with the P_2O_5 initially present in said phosphate rock, during the following ammoniation of the mother liquor, introducing ammonia to render the mass to a pH not substantially less than pH 7, and during the ammoniation when the pH of the mass is between 2.5 and 6.7, adding to the mass stabilizing metal ions selected from the group consisting of magnesium-, aluminum-, iron(II)- and iron(III)-ions in an amount corresponding to the proportion from about 1 to about 5 moles of stabilizing metal selected from said group per each 100 moles of P_2O_5 present in the mass, said stabilizing metal ions acting in said mass to prevent reversion of said dicalcium phosphate during the ammoniation to a form which is insoluble in ammonium-citrate.

2,967,799

Arsenosobenzene Pesticide. Patent issued Jan. 10, 1961, to Donald C. Wehner, Stamford, Conn., assignor to American Cyanamid Co., New York. A method of preventing the growth and development of a microorganism in contact with a substrate substance which is subject to attack by said microorganism and where the growth of the microorganism is undesirable, said microorganism being selected from the group consisting of bacteria,



SPRAY DRYER NOW IN OPERATION—American Agricultural Chemical Co. has announced that it now has in operation a new spray dryer measuring 26 ft. in diameter. The new piece of equipment is located at the company's facilities at Carteret, N.J., and was manufactured by Bowen Engineering, Inc., of North Branch, N.J. According to the company, the spray dryer shown in the photo above will be used by American Agricultural Chemical Co. for production of tripolyphosphates.

$N P_2O_5 K_2O$

12-12-12 16-8-8 14-0-14 15-10-10 20-10-10 12-12-12 16-8-8 14-0-14 15-10-10 20-10-10 12-12-12 16-8-8 14-0-14 15-10-10 20-10-10

Ammonium Sulfate . . . is the material which will help you produce better-conditioned mixed fertilizers at a faster rate of production. We suggest you use Ammonium Sulfate for *more* of the "top units" of nitrogen in your formulations. A dry, well-conditioned fertilizer stores better and drills better. This means more savings for you and your fertilizer customers. Your best source of dry nitrogen for mixed fertilizers is USS Ammonium Sulfate. It's 21% nitrogen and free-flowing. USS Ammonium Sulfate—a product of United States Steel—is available whenever you need it from several plants located to serve you efficiently. Contact your USS Ammonium Sulfate representative or the USS Chemicals sales office nearest you: Pittsburgh, New York, Chicago, Salt Lake City or Fairfield, Ala.

USS TRADEMARK **Ammonium Sulfate**

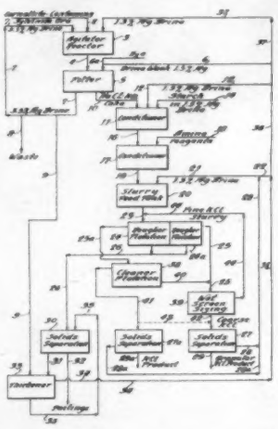
fungi and algae, which comprises incorporating with said substrate substance arsenosobenzene in growth-inhibiting amounts.

2,967,798

Insecticidal Repellent. Patent issued Jan. 10, 1961, to Willis N. Bruce, Champaign, Ill., assignor to Lee Ratner, Miami Beach, Fla. An insecticidal repellent comprising a combination of di-n-butyl succinate and an insecticide selected from the group consisting of pyrethrum, allethrin, and cyclethrin wherein said succinate makes up from about 99.5% to about 10% and said insecticide makes up from about 0.5% to about 90% by weight of said combination.

2,968,525

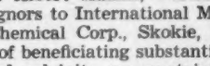
Potash Ore Treatment. Patent issued Jan. 17, 1961, to Howard P. Clark and Albert Adams, Carlsbad, N.M., assignors to International Minerals & Chemical Corp., Skokie, Ill. A process of beneficiating substantially liberated sylvinite ore containing carnallite, said carnallite being present in an amount of not more than 12% by weight, which comprises substantially completely removing the magnesium chloride content of said carnallite by leaching said ore with a magnesium chloride - containing brine substantially saturated with respect to sodium chloride and potassium chloride but at least sufficiently



unsaturated with respect to magnesium chloride to obtain a viscosity below about 6.0 centipoises measured at 15° C. after said leaching, and subjecting the solids resultant from said leaching to froth flotation in a magnesium chloride-containing brine substantially saturated with respect to sodium chloride and potassium chloride but at least sufficiently unsaturated with respect to magnesium chloride to obtain a viscosity of less than 4.5 centipoises measured at 15° C. and lower than the viscosity of the brine from said leaching, and recovering a sylvite concentrate.

2,968,398

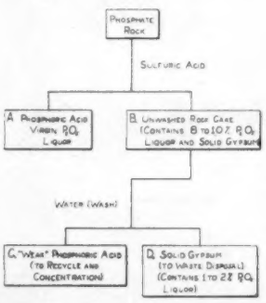
Synergistic Insecticidal Compositions. Patent issued Dec. 6, 1960, to Howard A. Jones and John A. Garman, Baltimore, Md., and Berton C. Dickinson, Lydonville, N.Y., assignors to Food Machinery and Chemical Corp., New York. A method of killing insects which comprises applying to the insects and their habitat synergistic insecticidal compositions comprising O,O-dimethyl S-(1,2-dicarbethoxyethyl) dithiophosphate and an organic carbamate ester



wherein M is selected from the group consisting of ethyl-encoxyethylene, tetramethylene and pentamethylene and R^1 is phenyl, said components being present in the ratio of about 2 parts in said carbamate ester to about one part of said dithiophosphate.

2,963,358

Production of Granular Fertilizers. Patent issued Dec. 6, 1960 to Robert White, Atlanta, Ga., assignor to Armour & Co., Chicago, Ill. A process for the production of a plurality of grades of granular fertilizer, comprising treating phosphate rock with sulfuric acid to produce phosphoric acid and rock cake, drawing off phosphoric acid from the rock cake, employing phosphoric acid drawn off from said rock cake in the production of a high grade fertilizer, mixing the unwashed rock cake with a dilute acid selected from the



group consisting of sulfuric, phosphoric, and mixtures thereof, adding phosphate rock dust and superphosphate to the mixture, and tumbling the resultant mixture in a drying atmosphere and within a rotary container to produce a lower grade granular product.

Idaho Phosphate Plant Now Back in Production

GEORGETOWN, IDAHO—Central Farmers Fertilizer Co. has resumed production of elemental phosphorus, high analysis phosphatic fertilizers and calcined phosphate rock at its Georgetown Canyon complex.

W. T. Tillotson, resident manager, said substantial orders are in hand to guarantee operations during most of 1961. The plant has been shut down since Nov. 1 for major overhaul of electric furnaces producing elemental phosphorus and for repairs to the acidulator and other equipment.

The CFFC furnace has a rated output of around 46 million pounds—or more than 20,000 long tons of phosphorus annually.

Mr. Tillotson said CFFC's Georgetown complex has orders now for 130,000 tons of phosphatic fertilizers in 1961 and expects to sell at least 75,000 tons of calcined phosphate rock to custom buyers.

"About 80% of total production is now in backlog for 1961," Mr. Tillotson said.

South Carolina Seeks Increased License Fees From Manufacturers and Dealers

COLUMBIA, S.C.—A proposal to increase license fees for agricultural chemicals in South Carolina is being made to the state's legislature in its 1961 General Assembly, presently in session.

Senator John W. Green, chairman of a special committee which between sessions conducted an investigation on the regulatory program, said that more personnel is needed to enforce the state's act, and that additional funds will be imperative to finance such a program.

The proposal calls for an increase in fees paid by manufacturers of pesticides and imposing a yearly license fee for both manufacturers and dealers in these products.

Under present law, manufacturers pay $5 per product registered up to 20 products or a maximum of $100, according to Senator Green. He will seek to increase that to $10 per product up to 30 products or a maximum of $300.

"The committee will propose a $25 dealer license fee and a $50 fee for all manufacturers selling agricultural chemicals in South Carolina," he continued.

"The increased fees will supply the necessary funds to carry out the expansion.

"We plan to increase the budget for the program to approximately $50,000," Senator Green declared, "and we believe we can provide the necessary service. The committee favors continuing the inspection program at Clemson because we found it could be handled more efficiently and economically there."

He added that the committee plans to require the State Crop Pest Commission to report at the end of each year to the General Assembly.

The group said that at present the only insecticides being tested were those used on cotton. "Nothing being done—no protection—on those used on tobacco, peaches and other crops," Senator Green says, "nor is there any checking on products which have not been registered."

He also points out the lapse of time between taking of samples and their analysis and return of report. "We need and we want to provide protection to those who are using insecticides in increasing number," the legislator declared.

Wheelabrator Announces New Canadian Company

MISHAWAKA, IND.—Formation of a new Canadian company, Wheelabrator Corporation of Canada, Ltd., has been announced by James F. Connaughton, chairman of the board.

The new corporation is the successor to the Canadian Division of Wheelabrator Corp. of Mishawaka, and was organized to handle expanding sales and fabricating activities for all provinces in Canada, the company says.

Wheelabrator supplies airless blast cleaning equipment, abrasives, and dust and fume collection systems from its plant in Scarborough, Ontario. It also has an office in Montreal, Quebec.

Harold M. Miller is president and Robert A. Campbell is vice president and general manager and is in charge of Canadian operations. J. D. Lamb is general sales manager.

Other officers are Jacob A. Schmidt, Jr., vice president, Edward T. Sullivan, secretary and treasurer, and James E. Donlan, controller.

Wheelabrator is a subsidiary of Bell Intercontinental Corp.

Canada Reports Rise in Fertilizer Consumption

OTTAWA—Sales of mixed fertilizers and fertilizer materials for direct application to the soil, including exports, amounted to 1,904,419 tons in the 12 months ended June 30, 1960, compared to 1,791,364 tons in the comparable year-earlier period, a rise of 6.3%, according to the Dominion Bureau of Statistics annual report on the fertilizer trade. Sales of fertilizer materials rose to 1,162,346 tons from 1,061,453 and mixed fertilizers to 742,073 tons from 729,911.

Production of fertilizer materials, including such items as ammonium nitrate, ammonium phosphate, ammonium sulphate, superphosphate and cyanamide, increased to 1,414,217 tons from 1,311,619 a year earlier, while output of mixed fertilizers decreased to 770,435 tons from 780,501. Imports of fertilizers rose to 1,070,000 tons from 950,999 and exports of materials to 918,626 tons from 842,792. Production and imports exclude anhydrous ammonia.

Profitable Year Seen by Borax & Chemical Officer

LOS ANGELES, CAL.—Sales of United States Borax & Chemical Corp. for the fiscal year ending Sept. 30, 1961 should increase over gross revenues for 1960 and the company hopes that 1961 net earnings will compare favorably with those of the previous fiscal year, it was stated by James M. Gerstley, president, in a recent speech before a group of security analysts.

The U.S. Borax executive said that the increase in sales is anticipated despite certain soft spots in the U.S. economy and some reduction in business currently being felt by certain domestic industries the company supplies with borax. Mr. Gerstley stated that expectations of increased sales are based on several factors. These include strong export demand for borax, which generally should continue throughout the year, while the outlook for potash sales is the best in several years.

South Carolina Pesticide Chemicals School Scheduled

CLEMSON, S.C.—The Tenth Annual Pesticide Chemicals School is scheduled for Clemson College Feb. 28-March 1.

The 2-day school will be under the joint supervision of Dr. J. H. Cochran, head, department of entomology and zoology, and Dr. W. M. Epps, head, department of botany and bacteriology. The program will get underway with registration on Tuesday morning at 9 a.m. The meeting will close at noon Wednesday, March 1.

Dr. Cochran and Dr. Epps point out that the school will be of interest to pesticide manufacturers, formulators, dealers and salesmen, county agents, vocational agricultural teachers, research and extension personnel.

Pesticide Trade Urged to Tell Its Side of Story to Community

By P. J. Reno*
Hercules Powder Co.
Wilmington, Del.

THE PESTICIDE industry has a definite responsibility to the community. Of first importance is the responsibility to be positive that use of products the industry makes will result in clean, wholesome foods, as well as adequate supplies of other agricultural products; and all this with the highest degree of safety to the public in general.

There is a secondary responsibility, also. This is to tell the story of industry's accomplishments in a truthful and forceful manner, so the public may continue to realize benefits in the form of better health and well-being, made possible by industry's products.

That the industry has carried out its primary responsibilities very well is a matter of record. The pesticidal products manufactured, sold, and recommended have truly raised the standard of living in the U.S.

But when it comes to getting the industry's story over to the public, we have only to glance at the reams of "sensational" stories and articles appearing in papers and magazines during the past few years, to see that we have fallen considerably short. We have failed to convince a large portion of the public of the importance of pesticides.

The quick succession of new and effective chemicals, and their successful control of many agricultural pests, has perhaps conditioned the American public to assume that today's agricultural output is just natural . . . with many people simply forgetting what life was like, even a few years ago, without adequate pesticidal protection against insects and plant diseases . . . when wormy apples, meager crop yields and epidemics of insect-borne diseases were commonplace.

It has been the privilege of the writer to visit many corners of the world where modern pesticides have been introduced only recently. In such places, the pesticide industry enjoys great prestige, and for excellent reasons.

In Egypt, for instance, cotton is the backbone of the economy. And they have some mighty tough cotton insect pests. The use of modern insecticides, however, has brought the Egyptian cotton economy to an enviable position. Egypt has increased its cotton profitability four-fold over the past six or seven years.

And in a country where communications to the farm worker pose a most formidable problem to agricultural authorities, even the fellahs in the most remote villages have grasped this fact: they have seen pesticide chemicals work a miracle . . . and they like what they have seen!

In Egypt, and in many other countries, they recognize that they **must** have supplies of modern pesticides if they are to have an adequate income . . . or even if they are to be able to continue to feed and clothe their population.

In the U.S., we are fortunate that we do not face such a critical problem of food supply . . . at the present time. With the help of pesticides the American food supply is the most abundant, most wholesome, most sanitary the world has ever known. Yet, there are those who would gladly remove every effective pesticide material from the marketplace if they could.

This small, but very vocal element has hurt agriculture, and it can hurt even more. Unless we meet our responsibility it could even destroy the progress made . . . and reduce the world's most productive agricultural nation to considerably less than a second-rate power.

The pesticide industry has met and will continue to meet its primary responsibility. We **must** educate the public to the true facts regarding pesticides, and work with all our resources to dispel the false philosophy of those who cast doubts upon our profession and our motives.

The cranberry scare of 1959 is enough to use as an example of what can happen. In many ways this was an unfortunate incident. Proper planning and good thinking from both the scientific and practical angles would have made the whole cranberry mess unnecessary. There are presently other problems—like one in California . . . concerning the "drift" of pesticides from a fiber crop to another crop used primarily as a feed for cattle. Many unknown factors are involved in both of these situations. However, the present California problem could have had great repercussions had not the highly skilled technical authorities there recognized the problem before it got out of hand.

Today, and even more in the future, pesticides must be used by farmers to produce the high quality and low-cost foods which consumers of the United States demand. In fact, as we look at the projected increases in food supplies to cope with our exploding population in the next two decades, we know beyond any shadow of doubt that more pesticides must be used, and more effective pesticides developed, if we are to avoid a food shortage.

And yet, it is entirely conceivable that our more vocal critics, though involving only a small percentage of the total population, could bring a halt to the use of existing pesticides and the development of new ones. Such a development would drastically affect every one of us in the trade.

But, of even greater importance, it would fatally curtail the supply of needed foods in the future. Chemicals are absolutely necessary for the production, processing and distribution of foods.

It should not be too difficult for anyone in the industry to speak out with a clear conscience and the courage of convictions against the detractors who spread untruths, and to those who are more easily convinced by scare headlines than they are motivated to seek the truth.

Well-known within the industry is the fact that millions of dollars are spent in research over a period of many years before a pesticide is placed on the market. Companies report expenditures of $1 million to $1½ million to comply with various governmental approval programs before any pesticide can be marketed.

But even if government requirements were not as strict as they are, pesticide manufacturers, for their own protection, would have to carry out extensive precautionary programs to have complete information on the product and to prevent mistakes in its use. One error could be ruinous, even to large manufacturers.

Beyond that, the manufacturers themselves are part of the public which must be protected. They and their families are consumers of food, too. Yet, critics attempt to convince the public that the pesticide industry is deliberately seeking to profit by the use of materials which it knows will poison the population!

Instead of poisoning food, the proper use of pesticides and growth regulators prevents rot, blight and other plant diseases and permits harvesting under optimum conditions of yield and quality, as well as upgrading the nutritional quality and consumer acceptance of food.

The present annual value of agricultural chemicals is forecast at over $280 million at the basic manufacturers' level. By 1975 this is forecast to increase to $1 billion.

Despite significant improvements in control methods and the emergence of new materials, insects destroy an estimated $13 to $15 billion in crops each year.

Combined with a rapidly growing population and shrinking farm manpower, this presents problems that eventually will create a serious national food shortage unless food production can be increased at better than past years.

We must have even greater technological and scientific progress in order to provide the projected demands of the nation's food supply.

We must have the support and understanding—yes, even the endorsement of the public—in order to achieve this goal.

How do we reach the public with the real truth of our activities? We members of the pesticide industry have this responsibility, but we do not have the responsibility all by ourselves. One group cannot do the job alone, nor should it be expected to. Each pest control operator, each entomologist, each research worker . . . everyone engaged in the use of pesticides . . . should assume this responsibility or at least be aware of the problem and be eager to correct the false impression that exists.

I believe the greatest success in carrying out our community responsibilities, in warding off the potential damage that could come from an aroused public acting in a vacuum of knowledge, will result from grass roots action.

*From talk presented before North Carolina Pesticide Conference, Raleigh, N.C., Jan. 10, 1961.

Increasing Importance of Phosphate Seen For Future Fertilizer-Making Processes

KNOXVILLE, TENN. — Greater advances have taken place in the technology and production of phosphate fertilizers in the U.S. in the past few years than in all of our earlier history and new advances appear in the offing, L. B. Nelson, manager of TVA's office of agricultural and chemical development, told the annual meeting of the Soil Science Society of North Carolina at Raleigh on Feb. 1.

These advances, he said, have far-reaching significance to agriculture, the fertilizer industry and the agricultural technician.

Dr. Nelson, speaking on "Phosphorus in Today's and Tomorrow's Fertilizers," said that the country now is producing about 16 million long tons of phosphate rock a year, of which about 60% is used in fertilizers. Approximately 73% is from Florida, 12% from Tennessee, and 15% from the western deposits. The bulk of the phosphate rock used for fertilizers is converted first to superphosphate. An estimated 89% of the superphosphate goes into the manufacture of mixed fertilizers and 11% is applied directly to the soil.

"Chemical phosphate compounds in today's mixed fertilizers differ markedly from those of a few years ago," he said. "The older fertilizers were made by dry mixing and their phosphate was present mostly as monocalcium phosphate. Present mixed fertilizers are made by chemically treating superphosphate with ammonia and this produces ammonium phosphate and dicalcium phosphate. . . .

"Phosphate consumption undoubtedly will continue to increase in response to the needs for more efficient farming and to the demands for more food and fiber as our population grows. The trend toward higher analysis of mixed fertilizers will continue, which means that normal superphosphates will be superseded by concentrated superphosphates, ammonium phosphates, phosphoric acid, and other high analysis phosphate compounds.

"There is every indication that greater use will be made of liquid mixed fertilizers.

"Inefficiencies in the recovery of phosphate rock in mining operations gradually will be overcome. Presently about a third of the mined rock is lost in washings and tailings. Higher recoveries would conserve phosphate deposits and might lower production costs.

"There will be a continuing shift to dependence on the huge western phosphate deposits and a consequent lessening of the drain on Florida and Tennessee reserves in the future.

"Development of a new 54% concentrated superphosphate utilizing 'superphosphoric' acid (produced by a new process developed by TVA) is definitely in the picture. This development should aid materially in increasing production of high analysis solid and liquid fertilizers."

Ammonium phosphate production is increasing rapidly now, according to Dr. Nelson, and will continue. A new material, ammonium polyphosphate, is a promising development, he says.

"This material has a typical analysis of 15-62-0. It can be used in solid mixed fertilizers and also has the great advantage that it can be stored in solid form and quickly made into liquid fertilizers as needed."

Dr. Nelson said there "are possibilities for new scientific breakthroughs. Atomic energy may find a place in the fertilizer industry. Ways may be found to produce new phosphate compounds for fertilizer use which are higher in phosphorus content than conventional compounds or materials and more effective in providing phosphate to the plant roots."

FMC Names Manager of Fairfield Chemicals

NEW YORK—The appointment of George Kerbey as manager of its Fairfield Chemicals Department has been announced by Food Machinery & Chemical Corp. Mr. Kerbey succeeds John Rodda, appointed assistant to the president of Food Machinery & Chemical Corp. (Croplife, January, page 2.) Mr. Rodda now directs activities of the corporation's Washington, D.C., office.

George Kerbey

Mr. Kerbey was Fairfield sales manager prior to his present appointment, and will continue to be headquartered at the department's New York office. He has been with FMC since 1954.

Hercules Begins Big Expansion Program

WILMINGTON—Hercules Powder Co. has announced the beginning of operations of a multimillion dollar expansion program at Hercules, Cal. The expansion includes new manufacturing facilities for the production of urea-form for fertilizer, methanol, formaldehyde, and urea-formaldehyde concentrates.

The newly completed program provides facilities for the production of 8,000,000 gallons of methanol per year, 50 million pounds of formaldehyde, and 11,000 tons of urea-formaldehyde compositions.

Hercules officials emphasized that sufficient capacity was installed to permit quantity sales of methanol and formaldehyde.

The new facilities are operated by the Explosives Department of Hercules, and establish the Hercules plant as one of the most diversified chemical operations on the West Coast. Products include anhydrous ammonia, nitric acid, ammonium nitrate solutions, grained ammonium nitrate, urea, urea-ammoninum nitrate solutions, industrial explosives and nitrogen tetroxide (an oxidizing agent for rocket fuel).

BUYS SPRAY FIRM

AUGUSTA, ARK.—Announcement is made that Mid-Continent Aerial Sprayers & Dusters, Inc., with headquarters at Havti, Mo., has purchased Agricultural Flight, Inc., here, the transaction including six airplanes. Mid-Continent has operated at McCrory and at Fair Oaks (Woodruff County) for the past two years.

Efficiency in Plant Food Production Is Watchword of Modern Texas Plant

EFFICIENT, modern plant food production is the watchword of the Sulphur Springs, Texas, plant of Red Star fertilizer division of Southern Farm Supply Assn. The operation, said to be one of the most modern in its area, boasts an unusual assembly of quality control devices, up-to-date manufacturing equipment and facilities for making both granular dry materials and liquid mixes.

Archie Edwards, manager of the division, says that when the plant was purchased in 1948, it was an "ordinary pulverized meal type" mixed goods and superphoshate production unit.

"In 1954," Mr. Edwards continues, "a $250,000 complete steel granulating building was added, the first and most modern of its type in Texas."

Here are other equipment items used in the plant for the production of a broad range of mixes, according to Mr. Edwards:

"We use a continuous pug mill type mixer and ammoniator. The product thus goes directly into the drying drum, rather than through a primary pelletizer as was installed in the original plant. It was found that our end product was just as uniform even though it had by-passed the primary unit. Thus an effective saving was made in both capital investment and maintenance expense by our making this move.

"Four Omega gravimetric feeders control flow of dry ingredients and Fischer & Porter magnetic flow meters are used for liquids such as nitrogen solution and phosphoric acid. These automatic feeders and meters have enabled us to hold our analysis within close tolerances, plus their further advantage of labor saving through automation.

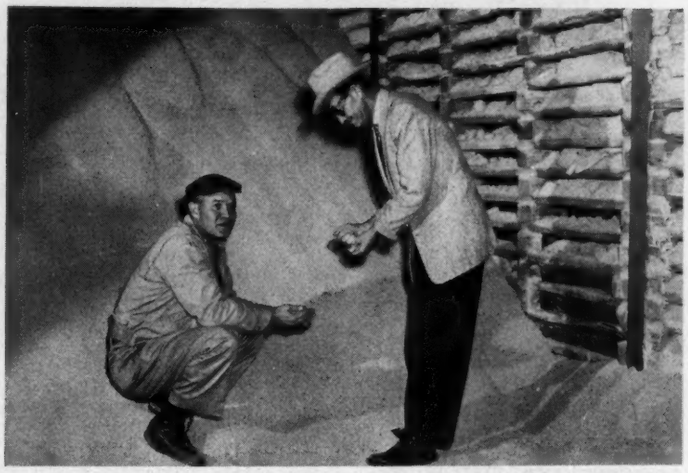
"Another labor and maintenance problem was relieved when we converted our conventional batch pan mixer in the super phosphate manufacturing unit, to a continuous process by devising a system to meter accurately phosphate rock and sulphuric acid in continuous flow. This was done by slowing the pan mixer slightly and devising a rather unique plow and vent system in the pan at a point that enables all the rock and acid to thoroughly mix prior to being dropped in the den.

"Although our people naturally spend a considerable amount of time in perfecting the metering devices, the effort paid off handsomely by increasing production by 25% and rendering an available phosphoric acid product of 18.75 to 19.10 after one night curing in the conventional den."

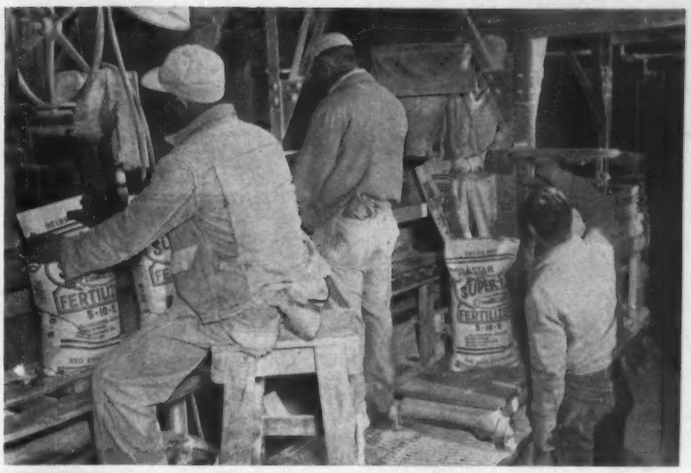
Mr. Edwards says that after curing all night, the super is pulled with a drag line type excavator to an elevator and overhead belt storage and thence to the storage pile. He says that two men are used in the super phosphate department as a result of this semi-continuous operation.

"To keep up with the trend to higher analysis fertilizers, we are now equipped to handle phosphoric acid, anhydrous ammonia, 52% triple super phosphate, and 62-63% white potash, plus all the regular grades of materials on the market.

"All our formulas were run and proved by an IBM system incorporat-



HOW'S THIS FOR UNIFORMITY?—That's what John Souter, left, and Archie Edwards in the upper picture are saying to each other as they inspect granular product made at their plant.



BAGGING OPERATIONS — The Red Star plant's bagging area boasts raised platform with screen floor to receive spilled fertilizer. Man at right is check-weighing bag. Plant recently switched to 50-lb. bags.

ing all higher concentrated materials."

Mr. Edwards declares that the company is constantly casting about to improve its methods of production in all phases, feeling that in doing so it can also render a better quality of customer service. Both the methods of production and also customer services require a major portion of attention at the Red Star plant.

The operation recently switched to 50 lb. bags, which it admits created problems of cost and slower production, but these were partially overcome by stepping up the efficiency of bag closing operations. Where only from 20 to 22 bags a minute were closed formerly, the company is now closing from 24 to 26 50-lb. bags a minute, which permits an 18 ton truckload to be filled in approximately 30 minutes. It is pointed out that customers like this kind of service.

The bagging operation is on a elevated platform raised 30 inches from the floor and bagging is done over a screen grid covering a hopper through which all spilled materials are returned through the bagging operation, thus reducing undue losses from spillage.

This arrangement accomplishes several things, according to the plant's management:

1. Less cleanup time is needed.
2. The arrangement gives better maintenance control.
3. The hazard caused by excessive dust underfoot is greatly reduced.
4. Cleaner housekeeping and better conditions result.
5. There is less contamination between grades.

The Red Star company uses its own trucks to serve dealers, but leases additional trucks when business demands additional service in the rush season.

The company has three basic departments, all under Mr. Edwards, general manager. These departments include the credit and office management department under the direction of Ewell A. Fox; production and analysis control is under the direction of John Souter, superintendent; and sales and marketing are the responsibility of Dale L. Campbell, director of the field service department.

The company has taken great strides in developing an "action program" of quality and customer service, which Mr. Edwards says put the company on the road to success. For example, the company maintains a flashy, white "super-flo" service truck, which is loaded with educational display and merchandising material, including soil testing equipment. All these services are designed, the management says, to boost sales of fertilizer and to make sure that the proper analyses of fertilizer are used.

Headquarters of the parent organization, Southern Farm Supply Association, Inc., are at Amarillo, Texas, where Tom C. Jones is general manager.

Western Pesticide Group Lauds Use of Chemicals

PORTLAND, ORE.—Necessity of chemicals in food production was emphasized more than once during the 8th annual Western Agricultural Chemicals Assn. northwest conference held here Jan. 18-19, along with the Northwest Vegetable Insect conference and the Western Cooperative Spray project.

"It is difficult to imagine what this nation would be like without use of fertilizers, insecticides, pesticides and the vast array of other chemical products used in production and preservation of foods," remarked Dr. Frank Kirkpatrick, Fresno, Cal., during a talk prepared by Dr. Robert H. White-Stevens, of American Cyanamid Co. "Certainly, we would not have enough food to adequately support half the country's population, and even if we did, we would not be the industrial power we now are."

Dr. Kirkpatrick, also with American Cyanamid Co., pointed out that if agricultural chemicals were not available, "there would be much higher incidence of disease—partly due to lack of bodily strength to fight disease, partly due to disease-carrying insects that are now kept under control. Our harvest would be one of blight and hunger instead of health and plenty."

The talk prepared by Dr. White-Stevens declared: "Every point, bar none, that is made by those who oppose the use of chemicals in agriculture, can be effectively contradicted with experimental evidence, economic justification and practical necessity."

While referring to the conflict between health and the use of agricultural chemicals in the production of food, the American Cyanamid Co. scientist charged that science has undoubtedly been remiss in not contradicting "evil and unfounded nonsense," particularly where it has been allowed to grow to the point where those charged with the responsibility for writing the laws of the land have been swayed in their judgment.

"Now we must try to undo the damage they have done, we must alleviate the fears they have generated, we must restore the confidence of the people and the safety of our food supply, and we must take measures to preclude further tampering with our nation's food supply," he told more than 150 agricultural chemical industry representatives at the session.

Dr. A. L. Strand, Corvallis, Ore., retiring Oregon State College president, emphasized that his institution is in favor of sufficient research work so that there is a sound basis for all agricultural chemical regulations that are enforced.

"I believe there is an imbalance between some regulations and the nation's health protection problem and that basic research is very closely related to solving these problems," Dr. Strand told the group. "When it comes to public relations, there is a definite imbalance between fact and fancy, and if this isn't straightened out we will run into an agricultural mess worse than that caused by the cranberry episode."

A panel discussion by two members of the agricultural chemical industry and four state college entomologists came to the conclusion that private industry and the ex-

OFFICERS AND VISITOR—Two officers of the Western Agricultural Chemicals Assn., George H. Weldon, Velsicol Chemical Corp., Berkeley, Cal., president (left), and Frank B. Stewart, general manager of Miller Products Co. (right), second vice president, chat with Jack Dreessen, National Agricultural Chemicals Assn., Washington, D.C., in center. The 8th annual WACA Northwest Conference was held at Portland, Ore., Jan. 18-19.

tension service should and could work more closely together in the crop protection program of the various regions. It was suggested that since private industry and state college scientists are generally working along the same channels on an independent basis they can go further more rapidly by working together.

The two industry representatives were Bob Eichmann, Stauffer Chemical Co., Portland, and Bob McCambridge, Chemagro Corp., San Mateo, Cal. Extension entomologists participating in this discussion were Robert Every, Oregon State College, Corvallis; David Brannon, Washington State University, Pullman; Clarence Davis, University of California, Davis, and George Knowlton, Utah State University, Logan.

A concise and educational explanation of pesticides legislation throughout the U.S. was given by Jack Dreessen, Washington, D.C., spokesman for the National Agricultural Chemicals Assn. He explained that the uniform or model state insecticide, fungicide and rodenticide act that was drafted by the Council of State Governments in 1946 is the basic act behind regulations in the majority of the states.

"Since the drafting of this act, some 30 states have adopted it. There are now some 44 states that regulate sale, distribution and transportation of pesticides with laws similar to the model act," the NACA representative emphasized. "The states of Oregon, Washington and California are not following the uniform act because their laws preceded drafting of this law. There is one good thing, however, and that is that the laws in the states are being enforced in the same manner as if they were uniform laws."

Mr. Dreessen indicated that the Oregon legislature now in session is scheduled to amend its pesticide control act and that the Washington state legislature, also in session, is scheduled to act on a bill which would follow the pattern of the model state enforcement law which would even go further—by restricting sales through the limiting of the number of dealers who would sell pesticides.

"I think the Washington state proposal could limit availability of the number of pesticides along with increasing cost to the farmer one way or another," Mr. Dreessen pointed out. He added that uniform laws and state laws, when properly enforced, are adequate to protect the public.

One of the features of the Northwest Agricultural Chemical conference was the naming of Hube Kenney, Chemagro Corp. salesman, Yakima, Washington, as the Northwest Agricultural Chemical Man of the Year. Mr. Kenney is the second man to receive this honor and joins Jack B. Holland, American Cyanamid Co. sales representative, Portland, in winning this honor.

He was presented a leather travel case by Keith Sieme, Miller Products Co., Portland, chairman of the Northwest public relations committee of the WACA, which had charge of this year's selection.

Mr. Holland was elected northwest WACA chairman to succeed L. E. Harris, Spokane, of the Grange Cooperative Wholesale.

Paul Eide, entomologist at the Washington State University branch experiment station, Mt. Vernon, was named chairman of the 20th annual Pacific Northwest Vegetable Insect conference to succeed Roland W. Portman, Moscow, Idaho, University of Idaho extension entomologist. New vice chairman is Howard E. Dorst, Logan, Utah, USDA research entomologist, who was last year's secretary-treasurer. The group's new secretary-treasurer is H. H. Crowell, Corvallis, of the OSC entomology department.

E. W. (Ted) Anthon, Wenatchee, Wash., entomologist for the Tree Fruit Experiment Station there, moved up as chairman of the 35th annual Western Cooperative Spray project to succeed Floyd Ellertson, Hood River, Oregon State College branch experiment station entomologist.

Other officers are Martin M. Barnes, Riverside, Cal., University of California citrus experiment station, chairman-elect, and A. S. (Tony) Horn, Boise, University of Idaho entomologist, secretary-treasurer.

There was considerable interest during the WACA conference in a lively panel discussion on "New Chemicals or New Registrations of 'Old' Chemicals That Will Be on the Market in 1961."

Members of this panel were A. O. Jensen, American Cyanamid Co., Oakland, Cal; J. R. McCambridge, Chemagro Corp., San Mateo, Cal.; James Hughes, Morton Chemical Co., Fresno; L. C. Glover, Shell Chemical Co., San Francisco, and Donald Dye, Stauffer Chemical Co., Portland.

CONGRATULATIONS—L. E. Harris, Spokane, Wash., outgoing chairman of Northwest Conference of WACA (left), congratulates Hube Kenney, Chemagro Chemical Co, Yakima, Wash., after the latter was named Northwest Chemical Man of the Year. Keith Sieme, Miller Products Co., Portland (center), and chairman of the WACA Northwest public relations committee, presented Mr. Kenney with a leather traveling bag.

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A BUSINESS PAPER FOR THE FARM CHEMICAL INDUSTRY

Don't Halt Research . . .

Finding Better Ways to Produce Continues As Important Part of Modern-Day Economy

BOTH THE pesticide and fertilizer industries are in a vulnerable position insofar as public and political criticism is concerned. People who look at the short term situation have expressed themselves as believing that both of these agricultural items are largely responsible for current surpluses. They say, in effect, "Let's cut down on the amount of fertilizer we make and use, and thus reduce production on the farm to a smaller figure."

Manufacturers of fertilizers and pesticides, the latter including herbicides, insecticides and fungicides, are not about to agree with this kind of philosophy. To shut off the full supply of these chemical tools would put agriculture back a good many decades, would make foods more scarce and thus higher-priced, and would cause farmers to take a giant backward step toward the ox team and the wooden plow.

Here are some thoughts along this general line expressed by W. M. Myers, head of the department of agronomy and plant genetics at the University of Minnesota before a Farm and Home Week audience the other day:

"Restricting 'production' research in the plant sciences as a means of combating agricultural surpluses would be disastrous to both farmers and non-farmers. The attitude that this research is responsible for over-production and depressed farm prices is a doctrine of inefficiency," he said. "To restrict further advances in agricultural technology by shutting off research is just as logical as preventing farmers from using improved seeds, fertilizers, insecticides and machinery."

Plant science research has three major objectives, he said.

They are: 1. Reducing the cost of production per unit of product. This may mean more production per acre. It also means lower seeding rates, more certain stand establishment, adaptation to mechanical harvesting, less expensive weed control and other advances.

2. Increased reliability of production by reducing crop losses by such things as winterkilling, drouth, storms, diseases, insects and weeds.

3. Improving market prices by better quality.

"We need more, not less, 'production' research in the future," he concluded.

That this is true, goes without saying. It is applicable to the research being conducted for better processing methods as well as for more effective means of utilization of the industry's products on the farm level.

The fertilizer and pesticide industries may be proud of the contributions they have made toward agricultural progress in the past, and will continue to find new and more efficient ways of producing the plant nutrients and pest control products needed.

To seriously consider curtailing research for better ways of manufacturing and halting the continual quest for more efficient means of utilizing the manufactured product is unthinkable. At the same time, it won't hurt for industry leaders to keep a weather eye out for signs of pressure in this direction.

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HOW RESEARCH and development has moved the industry along toward its present sturdy status is hinted at in a talk by David O. Quinn, extension plant pathologist and entomologist at West Virginia University.

He said that twenty years ago, the agricultural chemical industry produced some fifty basic chemicals for use in growing crops. This number now exceeds 200 and is still increasing. How rapidly new products have come on the scene is noted in the fact that of the 1959 volume of pesticides, around 50 million tons, some 90%, would not have been available at the start of World War II.

Another statistic of significance: farmers spent about $29 million each year for pesticides in the 1930's, but the figure is near the $260 million mark at the present time.

"The upward trend in the use of effective chemicals is going to continue for obvious reasons," Mr. Quinn says. "Consumers have come to expect products with quality and sanitation standards never dreamed of in past generations. Chemicals offer the only economical means to maintain this quality."

His address wound up with a highly sensible note to his farmer audience: "Chemicals are essential production tools. If we are to continue to provide food in the variety and quality we want, we have no present alternative to the use of chemicals. Surely, we are competent to use them to great advantage without harm to anyone."

Management's Attitude . . . Key to Safety in the Plant

WHO IS ULTIMATELY responsible for safety in the plant? Not the workmen, although one would think they would be interested in the subject from the standpoint of keeping themselves from getting hurt; not the supervisors, despite the importance of their diligence; but the spark-plug of any successful safety program is management itself. No safety effort can succeed much beyond mere lip service if it is not genuinely supported by the men at the top. "Safety First" must be more than a term; otherwise, safety men will waste their energy and develop ulcers.

In this, as in most other respects, management reaps what it sows. Attitudes toward safety, taken lightly, are quickly recognized by the men and the idea that rules are being winked at is communicated without ever being spoken.

Thus, the enthusiasm with which a safety program is launched and the attention it gets from management people appear to be the key to success in such a venture.

How does safety work in your plant? That is an important point to consider as the season of heavy production approaches and the temptation comes to take chances and safety shortcuts which could backfire seriously.

Plant management should know that without safe operation, production can suffer. One accident can disrupt output for days, wreck morale among the employees, and exact costs on the company severe enough to nullify much of the season's profits.

This year, let the men in the plant know that management is dead serious about their observing safety rules.

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Feb. 14-15—Second Annual Aquatic Weed Control Society meeting, LaSalle Hotel, Chicago.

Feb. 14-16 — Eighth annual agricultural chemicals conference, Texas Technological College, Lubbock, Texas. Drs. A. W. Young and Donald Ashdown, Texas Tech., program co-chairmen.

Feb. 15 — "Pesticides Review for Coastal Counties," sponsored by Western Agricultural Chemicals Assn. and California State Polytechnic College, on campus, San Luis Obispo, Cal.

Feb. 16-17 — Annual joint meeting, Midwest Industry - Agronomists, Edgewater Beach Hotel, Chicago.

Feb. 21-22—Pest Control Conference, sponsored by Alabama Agricultural Experiment Station and Extension Service of Auburn University, Thomas Jefferson Hotel, Birmingham, Ala.

Feb. 28-March 1—Tenth annual Pesticide Chemicals School, sponsored by Clemson College, Clemson House, Clemson, S.C.

March 3 — Midwest Agricultural Chemicals Assn., Omaha, Neb.

March 6-7—Southeastern Pecan Growers Assn., 54th annual convention, DeSoto Hotel, Savannah, Ga.

March 13-15—Western Agricultural Chemicals Assn. Spring Meeting. Disneyland Hotel, Anaheim, Cal.

March 22-24—North Central Branch meeting, Entomological Society of America, Hotel President, Kansas City, Mo.

March 27-28—Ninth annual California Fertilizer Conference, Kellogg-Voorhis Campus of California State Polytechnic College, Pomona.

April 12-14—Chemurgic Council, 26th annual conference, Sheraton - Gibson Hotel, Cincinnati, Ohio.

June 27-29—Twelfth Annual Fertilizer Conference of the Pacific Northwest, Marion Hotel, Salem, Ore. Chairman: B. R. Bertramson, agronomist, Washington State University, Pullman.

July 19-21—Southwest Fertilizer Conference and Grade Hearing, Galvez Hotel, Galveston, Texas.

Nov. 2-3 — Pacific Northwest Plant Food Assn. annual convention, Hotel Gearhart, Gearhart, Oregon.

Nov. 7-10—Packaging Machinery Manufacturers' Institute Show of 1961, Cobo Hall, Detroit, Mich.

Nov. 12-14 — California Fertilizer Assn., thirty-eighth annual convention; Jack Tar Hotel, San Francisco.

Spencer Sales Increase

KANSAS CITY, MO.—Net sales of Spencer Chemical Co. in the second quarter, ended Dec. 31, 1960, were 12% greater than a year before, the company reports. The improved second quarter volume of shipments in all major product lines moved total sales for the six months ahead of the same period a year ago, according to John C. Denton, president.

Earnings for the second quarter were the highest for any like period in five years. Consolidated net sales for the second quarter were $16,407,671, compared with $14,635,041 for the same 1959 period. For the six months ended Dec. 31, sales totaled $33,399,078, compared with $32,714,196.

Hooker Declares Dividends

NEW YORK, N.Y.—Hooker Chemical Corp. has declared a quarterly dividend of $1.0625 per share on the company's $4.25 cumulative preferred stock, payable March 29, 1961, to stockholders of record March 6.

The board also declared a quarterly dividend of 25¢ per share on the common stock payable Feb. 24, 1961, to stockholders of record Feb. 6. This is the company's 97th consecutive quarterly dividend on the common stock since 1937.

Classified Ads

Classified advertisements accepted until the fifth of each month for that month's issue.

Rates: 20c per word; minimum charge $3.00. Situations wanted, 15c a word; $2.25 minimum. Count six words of signature, whether for direct reply or keyed care this office. If advertisement is keyed, care of this office, 25c per insertion additional charged for forwarding replies. Commercial advertising not accepted in classified advertising department. Display advertising accepted for insertion at minimum rate of $12 per column inch.

All Want Ads cash with order.

HELP WANTED

CHEMICAL ENGINEER WITH FERTIlizer experience wanted, to conduct bench scale and pilot plant work. Florida location. Address Ad No. 6588, Croplife, Minneapolis 40, Minn.

FERTILIZER RESEARCH DEPARTMENT requires new supervisor with experience in fertilizer production and research. Write Smith-Douglass Co., Inc., Box 419, Dept. CR, Norfolk, Va.

PRODUCTION ASSISTANT SUPERINtendent with minimum of two years' supervisory and production experience for powder mixing plant in Atlanta area. High school graduate essential. Career opportunity with large national company. Excellent benefits. Send complete resumé to Ad No. 6592, Croplife, Minneapolis 40, Minn.

REQUIRED IMMEDIATELY
FERTILIZER
SUPERINTENDENT

Canadian Chemical Manufacturer requires Plant Superintendent for its fertilizer plant located in Southern Ontario.

Applicants should have proven single and triple fertilizer experience, should be between the ages of 30 and 45 and be willing to live permanently in Canada.

All applications will be held in the strictest confidence and will be answered.

Address Ad No. 6593, Croplife
Minneapolis 40, Minn.

HELP WANTED

RESEARCH SUPERVISOR WANTED TO head new fertilizer research department. Several years' experience in fertilizer production or research and development. Location — seaport city, Middle Atlantic States. Address Ad No. 6590, Croplife, Minneapolis 40, Minn.

ASSISTANT PLANT SUPERINTENDENT— Leading western fertilizer producer needs assistant plant superintendent. Desire chemical engineer, metallurgist or chemist, experienced in fertilizer production and supervision for integrated sulphuric, phosphoric, ammonia phosphate and fertilizer plant in Northwest area. Excellent benefits and starting salary with advancement opportunities. All applications held in strict confidence. Address Ad No. 6608, Croplife, Minneapolis 40, Minn.

GENERAL MANAGER NEEDED—THIS IS an opportunity in the southeastern United States for an aggressive general manager capable of handling feed mixing and production, fertilizer mixing and sales, cotton gin management, local public relations. Must have sound knowledge of fertilizers, insecticides, feeds and seed merchandising. Salary commensurate with ability. Replies held confidential. Address Ad No. 6621, Croplife, Minneapolis 40, Minn.

MACHINERY FOR SALE

BULK PHOSPHATE HANDLING EQUIPment. Undertrack auger, upright bucket elevator, underbin auger, loading auger. All three phase motors. Russell Rickett, Forest City, Ill.

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